

Perception and Evaluation of Regional and Cohesion Policies by Europeans and Identification with the Values of Europe

PERCEIVE

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Deliverable 2.5

“Report on the results of the convergence analysis of EU citizens' identification with the EU project”

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1. Introduction.

Does the perception of the EU vary across countries and regions? To what extent has the support for European integration and citizens' attitudes towards the EU in regions with different socio-economic contexts evolved? Are they affected by the Cohesion Policy? More specifically, does the perception of the EU vary with the intensity of the policy in the region and with the effectiveness in which the funds allocated are finally spent? Is there a relationship between the deviation in funds' allocations and actual expenditures, and the socio-economic characteristics of the region? Finally, are citizens in growing and, particularly, converging regions more prone to support the European project and have positive attitudes towards the EU?

This deliverable aims to provide answers to these and similar related questions. It includes the results obtained from the implementation of Task 2.5 in Work Package 2. A battery of theoretical arguments from different literatures are used to guide the analyses carried out and to interpret the results obtained. Similarly, the empirical methods used in this study are selected among those suggested and applied in the extant literature. They are modified in some cases to account for the specificities of our analyses and to overcome some drawbacks that result from the direct application of the methods.

To obtain the results included in this deliverable we use statistical information from several sources. In the first place, the aggregate measures of the citizens' perceptions of the EU at the country and regional levels are computed using the micro-data files of the Eurobarometer surveys for several years. In addition to the ones prepared in the context of Deliverable 2.1, several others have been downloaded, prepared, and merged to have enough observations to compute regional aggregates. On the other hand, data for Structural Funds expenditures and several socio-economic magnitudes, including the ones required to compute indicators of economic growth, have been taken from the PERCEIVE regional database. As described in Deliverable 2.1, homogeneous regional data for most of the indicators used in our analyses are available from 2000 to 2014. Therefore, this is the time span used to compute most of the results in this deliverable. Finally, information made available in different websites of the European Commission is used to complete the comprehensive analysis of the absorption of the Cohesion Policy funds in the regions. In this case, the focus is on the data for the last completed programming period (2007–2013). In this respect, it should be mentioned that a lot of attention is paid to analyse the characteristics of these data, and to use it in the most appropriate way to obtain reliable measures of the effectiveness with which the EU funds allocated to each region are managed and

used. In other words, the region's capacity of efficiently absorbing the funds allocated to the region.

Consistent with the content of the Grant Agreement, the specific objectives of this deliverable can be summarised as follows:

- To provide a detailed description of the EU Cohesion Policy in terms of EU funds effectiveness based on regional aggregate data on funds commitment and absorption provided by the European Commission.
- To propose measures of effectiveness in the management and use of the EU Cohesion Policy funds that complement the traditional one based on the difference between allocations and actual payments at the end of the programming period.
- To study the relationship between these measures of effectiveness and the region socio-economic context, for the programming period 2007–2013.
- To highlight the limits represented by lack of timely available and comparable data on EU funds results and impact, and how this affects the quality of structured quantitative analyses.
- To assess the degree of disparities between countries and, particularly, among regions in the citizens' perception of the EU, and to analyse the evolution of disparities in support for the European integration and attitudes towards the EU.
- To study the impact of the financial and sovereign debt crises, and subsequent adjustments, on the regional distribution of citizens' perceptions of the EU.
- To test whether or not there is a positive relationship between the incidence of the Cohesion Policy in the region and its citizens' support for the European project and their attitude towards the EU. In particular, to explore if positive perceptions improve with the intensity of the policy, proxied by the total amount of Structural Funds payments in the region, and with the effectiveness of its management and use (defined as the capacity of absorbing the funds allocated to the region).
- To evaluate the influence of the context of the region on its citizens' perception of the EU. More precisely, to explore the relationship between the EU perception and indicators of the socio-economic, territorial, and institutional context of the region.
- To analyse the impact of the intensity of the Cohesion Policy on regional economic growth, considering information from the most recent programming periods and from regions in the oldest and newest member states. And, to

check if the growth effect of the policy varies depending on the initial level of development of the region.

- To test whether and to what extent economic growth in the region affects the degree of support for the EU and positive attitudes of its citizens towards the Union. A dynamic regional economy is expected to affect positively the perception that individuals have of the economic situation of the region and the potential benefits of being part of the EU. Eventually, this will increase their support for the European project.
- To check whether convergence to the EU standards of income per capita of the less developed regions contributes to improve the vision that their citizens have of the EU, in comparison with similar non-converging regions and with those with income levels above the average.

To achieve these objectives, the deliverable is organised in 6 chapters. In addition to this introduction and the sixth chapter that summarises the results and provide some conclusions, the contents of the chapters are as follows:

- Chapter 2 provides a comprehensive review of the analyses produced so far regarding the absorption of the funds of the EU Cohesion Policy. It discusses the characteristics of the measures used so far and proposes alternative indicators. They are computed and analysed using the most recent data available to conclude on regional disparities in the effectiveness of the management of EU funds.
- Chapter 3 computes several regional indicators of the citizens' perception of the EU, distinguishing between support for the EU project and citizens' attitudes towards the EU. It describes disparities between countries and regions in these indicators, and discusses its evolution from 2000 to 2016.
- Chapter 4 reports and discusses the results of the impact of the Cohesion Policy in the region on the citizens' perception of the EU. It takes into consideration both the intensity of the policy and the effectiveness in its implementation. To do so, it uses the measures computed in Chapters 2 and 3.
- Chapter 5 focuses on the impact of Cohesion Policy on regional growth, and whether growth and convergence eventually influence the degree of support for Europe and attitudes towards the EU. It uses the indicators of perception computed in Chapter 3 and the methodological framework designed in Chapter 4.

In addition to the natural links between the different chapters of the deliverable, the work carried out considers inputs from other deliverables of the PERCEIVE project:

- We benefit from the results and from the general information related to the design, allocation, and management of Cohesion Policy funds, in the different outcomes of Work Package 1. This deliverable also takes profit of results derived from the project's survey in Work Package 1.
- We use the literature reviews about the mechanisms and determinants of the support for the European integration and the formation of a European identity in Deliverables 2.2 and 5.1.
- We use results for the indicators and measures of citizens' perception from the project's survey in Deliverables 1.2, 2.2, 2.3, and 2.4. The data and information from Deliverable 2.1 are crucial for the work with the magnitudes of the regional context.
- This deliverable also benefits from the discussion of the work that is being carried out in Work Package 6, since some of the mechanisms in the simulation model are related to the analyses performed in Task 2.5 of Work Package 2.
- Some arguments, definitions of indicators, and modelling strategies used in this deliverable are influenced by results obtained in Work Packages 4 and 5 (e.g. Deliverables 4.5 and 5.4).

Finally, it should be mentioned that some of the analyses included in this deliverable take advantage of the outputs produced under the umbrella of the H2020 COHESIFY project. We try to provide complementary evidence and minimize any unnecessary overlap with the analyses performed in that project.

2. EU Cohesion Policy Performance: Measures and Regional Variation.

2.1. Introduction: Aims and scope of this chapter.

As already commented in previous reports of the PERCEIVE project, **the Cohesion Policy** has been the main tool for the reduction of territorial disparities across regions of Europe. It is considered to be a key redistributive mechanism with which to achieve the Europe 2020 goals of creating growth and jobs, tackling climate change and energy dependence, and reducing poverty and social exclusion. A total of EUR 347.45 billion was allocated to financing Cohesion Policy (CP) between 2007 and 2013 to cover three main objectives: 'Convergence', 'Regional Competitiveness and Employment' and 'Territorial Cooperation'.

With respect to the way of organising the funding, the CP is delivered through **three types of Funds**:

- the European Regional Development Fund (ERDF), which aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions;
- the European Social Fund (ESF), which invests in people, with a focus on improving employment and education opportunities across the European Union; and
- the Cohesion Fund (CF), aimed at Member States (MS) whose Gross National Income per inhabitant is less than 90 % of the EU average.

As the **ERDF** basically aims to assist less developed regions, these funds are mainly allocated to EU regions characterized by low development in terms of per capita GDP (below the 75% of the EU average) as well as to regions with declining traditional industries facing restructuring challenges among others. The orientation implies a clear spatial dimension. This is also the case of the **ESF** which aims at addressing the problems of the labour market in some regions. During the 2007-2013 programming period, due to the 2007 and 2014 rounds of enlargements of the EU and the consequent relative increase in the per capita GDP of some regions of the old MS, a transition period was adopted for some of them: 15 phasing-out regions covered by objective 1 (within the Convergence budget) and 15 phasing-in regions included in objective 2 (within the Competitiveness budget). The **CF** provides assistance to the MS whose national income per capita is below 90% of the EU average, which were Greece, Spain, Portugal and Ireland at the beginning of the fund in 1992. With the enlargements in 2004 and 2007 this

Fund incorporated 10 new MS from Central and Eastern Europe plus Cyprus and Malta and also considered Greece and Portugal.

The effectiveness in the absorption of funds is a permanent challenge for EU MS, and as a consequence, the analysis of the absorption capacity is needed in its different spheres: its scope, its determinants and its effects. The present document deals with the first one, the scope of the absorption of EU resources and focus on an aspect that has been widely forgotten so far: **the regional variation in the absorption of the Structural Funds (SF).**

The **main objective** of this second chapter of the deliverable is to make a **descriptive analysis of the performance of the EU CP in terms of EU funds effectiveness** based on EU regional aggregate data on funds commitment and absorption provided by the EC. Given that the target of the CP are the regions (at NUTS2 level), our **spatial analyses** are provided at this level. The results are commented at the light of the results of the case study analysis on EU funds policies. In this sense, we have tried to highlight the limits represented by lack of timely available and comparable data on EU funds results and impact, and how this affects the quality of structured quantitative analyses as the ones made in the remaining chapters of this deliverable.

The chapter is outlined as follows. After this introduction, we discuss the different measures that have been used in the literature so far to proxy for the CP performance in terms of the effectiveness in the use of the EU funds and we suggest some additional possibilities. Then, we present the data and discuss how they allow us to construct the indicators of effectiveness at the NUTS2 level. Afterwards, we present a comparative analysis across EU regions on these measures showing the regional differences both within countries and across countries and the correlation of such effectiveness measures and key socio-economic magnitudes. Additionally, we focus on the 9 regions under study in this project and analyse their performance of the CP in light of the results previously obtained for them. Finally, we offer a review with the main limitations suffered to make this regional analysis.

2.2. Measures of CP implementation effectiveness: Literature review and further suggestions.

2.2.1. Literature review of the measures to proxy for the CP implementation effectiveness.

Among the indicators commonly used for measuring the CP implementation effectiveness, we find the volume of funding allocated and/or paid (A) and the rate of absorption of the funds (B).

A. Scale of allocations and payments

Focusing on the scale (volume) and structure (distribution across thematic areas) of the funding allocated and/or paid gives information on how the funding was provided to regions across the EU, how it was used and what the money was spent on. Several studies use either the allocations or the payments of the different Structural Funds (SF) for different purposes: i) description of the scale in the use of the SF; ii) study of the determinants of the amounts allocated or paid within the CP for different regions/countries; iii) analysis of the impact of the CP.

Among the studies that **describe the regional implementation and performance of the CP (i)**, we find the report by Gorzelak et al (2016) which analyses the volume of financial allocation in the Operating Programme (OP) 2007-2013 at the NUTS2 regional level (both in per capita and as a share of GDP) as well as their structure across areas. As expected, the allocation of CP funds per capita strongly varied across European regions as a consequence of this policy which is foremost focused on Cohesion countries and less developed regions.

Second, with the objective of **studying the determinants of the effectiveness in the implementation of the CP (ii)**, Fratesi and Perucca (2014) assess the role of specific territorial conditions on ERDF and CF commitments at different category levels in the NUTS3 EU regions in the new MS (NMS) in the period 2000-2006. According to their results, regions more endowed with specific types of territorial capital are more able to gain from policy investment in related fields. With a similar objective, Bouvet and Dall'erba (2010) examine which variables, economic and political, determine the actual funds allocation for each cohesion objective over 1989-99, concluding that economic criteria are not the only determinants of funds allocation, but the political situation within a country/region and the relations between various layers of governance also influence the allocation process.

Third, a significant number of papers **analyse the impact of the effectiveness in the CP on economic growth (iii)**. In order to do it, Percoco (2017) focuses on SF expenditures in the programming period 2000-2006 in the NUTS3 regions. The

same is done in Gagliardi and Percoco (2017) concluding that European funds positively contributed to generate economic growth in lagging areas, a phenomenon mostly driven by the successful performance of rural areas close to relevant urban agglomerates. In a similar manner, Mohn and Hagen (2010) analyse the economic growth effects of EU SF, making use of the payments for 126 NUTS1/NUTS2 regions, distinguishing between Objective 1, 2, and 3 payments. Among others, they obtain that Objective 1 payments promote regional economic growth, whereas the total amount of Objectives 1, 2, and 3 do not have a positive and significant impact on the EU regions' growth rates. Similarly, Rodríguez-Pose and Novak (2013) obtain an increasing impact of SF expenditure over time, with more impact in recent programming periods, partly attributed to policy learning mechanisms. Finally, Iatu and Alupui (2011) analyse the progress of Romania in the absorption of SF, through allocations, identifying a number of economic, social, administrative or policy factors affecting the low absorption (measured through allocations) at NUTS3 administrative level for the 2007-2013 period, finding the major influence of policy factors.

B. Absorption capacity

Despite part of the literature use the allocations/payments as a proxy of the effectiveness in the implementation of the CP, the primary indication is measured as the level of spending out of the allocated resources, which is known as the absorption rate and computed as the rate that expenditures represent as a percentage of allocation. The **absorption capacity** can be understood as the degree to which a state/region is able to fully spend the allocated financial resources from the EU funds in an effective way. Boot et al (2001) is considered the first work which systematically put forward the notion of absorption capacity and Cace et al (2009) addressed the concept in relation to EU enlargements, showing how the European diversity reveals different administrative systems in the absorption of the funds.

As signaled in SWECO (2008), “the funding actually received depends on the absorption capacity of the MS and their regions, i.e. their ability to use the financial resources made available from the ERDF and the Cohesion Fund on the agreed actions and according to the agreed timetable” (page 26). This capacity is necessary for making a maximum contribution to economic and social cohesion with the resources available from the EU funds, although it is not a sufficient condition. In any case, the absorption rate has been considered to be a key indicator for the monitoring of the programmes.

But, why a state/region may not absorb all the funds that have been allocated to it?

Theoretically speaking, great part of the literature considers that territories have a limited capacity to absorb external investment support because of the existence of restrictions on both the demand and the supply side.

The absorption capacity on the *supply side* (the institutional system, created by the respective state to administrate the funds) implies the actual ability by project applicants to generate acceptable projects and is determined mainly by (Šumpíková 2004; Šumpíková et al 2003; Zaman and Georgescu 2009):

- Macro-economic absorption capacity: the upper limit for SF and CF together has been generally defined as 4 % of the GDP of the respective country;
- Financial absorption capacity: the ability to co-finance EU supported programmes and projects, and to collect these contributions from several partners (state, regional and local authorities, private bodies);
- Administrative capacity: the ability and skills of central, regional and local authorities to prepare suitable plans, programmes and projects in due time, to decide on programmes and projects, to arrange the co-ordination among principal partners, to cope with the administrative and reporting requirements, and to finance and supervise implementation properly, avoiding irregularities as far as possible.

In many cases, the absorption of the funds is associated with the administrative capacity. However, the administrative absorption capacity by public administration refers only to handling the EU resources and, on the part of recipients, to their ability to fulfil the administrative requirements for making eligible expenditure and therefore public co-financing. Whereas according to Boot, de Vet and Feekes (2002) and Mrak and Wostner (2004) absorption capacity is a broader concept than administrative absorption capacity as it refers to the quality of the whole development policy cycle: planning, project generation and selection, implementation, monitoring and evaluation of development activities.

On the other hand, the absorption capacity on the *demand side* (from beneficiaries which are targeted to use the funds) is the ability of the applicant to develop projects.

All in all, the literature considers the administrative capacity (i.e. the ability to manage SF in compliance with the respective legislative framework) and the ability to prepare projects as the main restriction in using the EU funds effectively in present time.

Within the European context, the European Commission has elaborated several studies where the absorption capacity is understood as the degree to which a country is capable to spend, actually and efficiently, the financial resources

allocated from the SF (European Commission 2003). In such reports, the institutional factors affecting the capacity of absorption are discernable both within the European Union and at the national level. The European institutional factors are mainly related with the European Commission and the fulfilled functions, predominantly those concerning the transparency of SF allocation and the coherence of funds utilization (Horvath, 2005, p. 9). Whereas the institutional factors at the national level are related with the real structure of the economy, the institutions which set the salaries, the capacity and capability of the economy, the organisation of the political system (federal, central etc.) and the economic policies (Cace et al 2009).

As a general conclusion when reviewing the effectiveness of the CP, the literature signals that its impact is conditional on good management practices or, more generally, on the institutional or absorption capacity of the recipient regions and MS (Wostner 2008), something which is transferred to the **empirical literature**. Many papers use the absorption rate of the different SF as a proxy of the effectiveness in their use, albeit with different purposes: i) description of the absorption capacity of different states/regions; ii) analysis of the determinants of the absorption capacity; iii) study of the impact of such absorption capacity on economic, social and territorial cohesion.

Within the first group, one of the first studies **measuring and describing absorptive capacity (i)** is Hervé and Holzmann (2008), who bring empirical proofs on the capacity of the less developed regions to absorb important amounts of funds allocated to decrease the difference of development across regions. They make a classification of absorption problems based on the concept of government failure. Later, the report by Gorzelak et al (2016), by computing the share that the payments represent over the total funding in the OP 2007-2013, get the picture that implementation began slowly, accelerated in 2012 and by the end of March 2016 more than 90% of the allocations to the ERDF and CF had been paid to MS.

With the objective of **investigating the determinants of regional absorption capacity (ii)** in the EU, Kersan-Skavic and Tijanic (2017), in a recent paper based on 272 NUTS2 regions (the 86 NUTS2 convergence regions and the 186 developed regions with GDP per capita above 75% of the EU average) during the period 2000-2013, confirm that the absorption of EU funds is conditionally affected by regional economic characteristics. Other papers on the determinants of absorptive capacity at the EU level are Iatu and Alupului (2011), Tosun (2014) and Mohl and Hagen (2010), whereas most of the remaining ones are usually focused on case studies or comparison analyses. These papers obtain that labour market characteristics (workers' educational level and unemployment rates), decentralisation, investments, institutional framework and infrastructure development are

significant determinants of the absorption capacity. For our purposes, looking at the proxies these papers use for the measurement of the absorption capacity, Mohl and Hagen (2010) use payments over commitments and Tosun (2014) uses the percentage of ERDF allocations that have been paid out. The latter shows that there are significant differences in absorption performance between old and new MS, the latter performing better new MS absorbed 94.37 per cent of ERDF allocations vs 91.03 for old MS in the 2000-2006 period). Tobit models conclude that ERDF absorption performance is positively correlated with government capacity and negatively with fiscal decentralization and also that those countries with higher income levels are less likely to maximize absorption.

Most of the literature on the determinants of the absorption of the funds are case studies. Markovic et al (2008) analyse if higher absorption effectiveness is connected with a certain form of administration and implementation framework of funds. They focus in the 3 countries with good absorption success: Ireland as the leading country among the EU-15 countries and Estonia and Slovenia as the leading countries among the new accession countries. For their study, they consider that there are different ways to measure absorption: i) the share of the application over total commitments, ii) the share of signed contracts over total commitments, and iii) the share of certified expense claims over total commitments. They focus in the last one, which according to their opinion represents how much money has been transferred to the final recipients. Regarding administration and implementation systems of Cohesion funds in those countries, the authors confirm a high diversity: Ireland has a decentralized managing system with several managing authorities and paying authorities, also on the regional level, while Estonia and Slovenia have a more centralized system on a national level. However, they could not come to a conclusion on which of the three structures facilitates more the absorption of EU funds, concluding that different implementation structures can lead to high absorption results.

The paper by Kersan-Skavic and Tijanic (2017) offers different proxies for absorption capacity (Committed/Decided; Paid/Committed; Paid/Decided). No matter which indicator is used, there are significant differences in the levels of absorptive capacity across EU countries and regions. However, in their regression analysis, they decided to use the indicators payments per capita and payments over commitments as indicators of the regional absorptive capacity.

The absorption capacity of the candidate countries have also been the focus of an important part of the empirical research, such as in Horvat (2003, 2005), Wostner (2008) and Cace et al (2010). In addition to the recommendations they give as to how SF can be used in most effective manner, Horvat (2003) notes the absence of a conceptual framework to comprehensively assess the issue of absorption

problems relating to SF, and makes explicit use of the development economics and public choice literatures. Horvat (2005) gives a 'golden rule' on the virtuosity of concentrated implementation systems, stating that "the smaller the number of institutions (usually sectoral Ministries) involved at the levels of Management and Programmes (Sectoral and Regional) presented at the level of Programming in the Candidate Countries, the clearer the picture and higher the possibility of better administrative absorption of SF" (*Ibíd.*, p.13). This paper also points to the need to ensure continuity of personnel as well as having close political relationship between the Managing Authority and the Prime Minister. Cace et al (2010) point to the transfer of responsibility towards the new MS, including the absorption of the European funds, which implies an infrastructure harmonized with the European criteria, but lacking the experience to match with the new parameters of competitiveness.

Finally, many papers **investigate the impact of the absorption capacity of the funds on economic, social and territorial cohesion (iii)** both in individual MS and at the EU level: Rodríguez-Pose and Fratesi (2004), Bachtler and Gorzelak (2007), Marzinotto (2012), Molle (2015), McCann (2015), Gorzelak (2017) and Bachtler et al (2017) are among the most well-known and recent ones. There are not common main findings since some obtain that funding under the CP does not affect territorial differentiation, whereas some others observe that the CP drives territorial convergence within individual countries but widens territorial divergence in the whole EU. These discrepancies in the results are not strange, given the different economic and social objectives addressed by the CP, which are often impossible to separate with the data available. A recent special issue in Regional Studies offers some papers showing in what contexts and under what conditions CP can be more effective. All in all, these papers show the relevance of the context in explaining the effect of CP, especially with respect to economic and geographical structure, as well as administrative capacity (Fratesi and Wishlade 2017). At the end of the day, as signalled by Mohl (2013), the impact of CP would depend on the quality of the institutions and government structures. As pointed by Gorzelak et al (2016), CP can be understood as a means to counter the deficiencies in less developed regions and as a way to get the necessary conditions for growth. But it does not assure the impulse of economic activity which is mainly driven by the investments of private actors.

2.2.2. Suggested measures to proxy for the effectiveness of the CP.

Most of the indicators described above for proxying the concept of effectiveness of the CP are computed as ratios between Decided, Committed and Paid funds, or over total population of the regions. This information actually captures the overall amount of money finally arriving to the region. Still, it does hardly account for how effectively the funding is used. In this section we take advantage of the pluriannual spirit of every programming period and we propose considering the evolution of the expenditure and not only the final figures as explained next.

One could think that the speed at which one country/region makes the expenditure of its allocated funds can give an idea of how well the funding in a programming period is being used. Alternatively, when a high share of the allocated funds is spent in the last years, it can be understood as a signal that the authorities of such region spent them in the last minute in order not to lose the funding. Of course, this reasoning may not be true in all cases, but we believe that it can be interesting to see whether there are different regional/national patterns in this respect.

In the design of such alternative measures of effectiveness, we must take into account that the programming period under analysis covers seven years (from 2007 till 2013), which is the time frame for the budget allocations to individual programmes. However, the programmes are still being prepared in the first months of this period; afterwards they are individually submitted and approved once the negotiation procedures finish. The payments can take place during 3 years later to the end of the programme, so that we consider 2016 as the ending year. That is, a total duration of 10 years. This is an important information when assessing the degree of absorption, although in our case, since the programme finished almost 5 years ago, this should not imply any important problem.

We think the following measures can be of interest in the study of the effectiveness in the absorption of the funds:

- Share of expenditures (over total expenditures) accumulated after 3 years of implementation of the programme (2007-2009).
- Share of expenditures accumulated after 5 years of implementation of the programme (2007-2011).
- Share of expenditures accumulated in the last 3 years (2014-2016).
- Years needed to accumulate 25% of the expenditure.
- Years needed to accumulate 50% of the expenditure.
- Years needed to accumulate 75% of the expenditure.

We expect that the share of payments in the first 3 years of the OP is very limited, in part as a consequence of the n+3 rule, so that the programmes could have an extended delay due to a concentration of emphasis on completing the expenditure of funding for the 2000-2006 period. After 5 years, a substantial share of the payments is expected. It will also be interesting to analyse the correlation between the 3 first measures and the 3 last ones.

2.3. Data available to proxy for the CP implementation effectiveness.

The information with data on the SF and their impact is given in several webpages, with certain overlapping in their content in some cases, making it difficult to follow the information available. The main tools are:

- The webpage of the **DG REGIO, Regional Policy** has a section under the label of **Data for research** with information given for different programming periods: http://ec.europa.eu/regional_policy/EN/policy/evaluations/data-for-research/
- Increasingly, this data is made available on the **ESIF Open Data Platform** in the **data catalogue**, where you may find metadata pages and links to graphs giving insights into the dataset contents: <https://cohesiondata.ec.europa.eu/browse>. Although it provides mainly information for the 2014-2020 period (structured by theme, MS, fund), you can also find information on several datasets for the 2007-2013 period, although most of them are given at the MS level
- Another section of the **DG REGIO** webpage offers the **results of the evaluations** of the results of the CP:

http://ec.europa.eu/regional_policy/en/policy/what/investment-policy/

More specifically for our interest on the **absorption rates**, in the ESIF Open Data Platform, under the link <https://cohesiondata.ec.europa.eu/2007-2013/SF-2007-2013-Funds-Absorption-Rate/kk86-ceun> you find information on the absorption rates for SF 2007-2013 of the EU CP (ERDF+CF+ESF) including European Territorial Cooperation. The data present the annual payments (not cumulative) made by the Commission from the EU budget to the MS broken down by Fund and by year. The payment amounts show the payments made during each year broken down by interim payments and pre-financing. This way, the absorption rate shows the % paid to each MS compared to total available budget. This information is provided **only at the country level**. Also at the national level, you find the information on the total allocation of EU SF for the programming period 2007-2013 in <https://cohesiondata.ec.europa.eu/2007-2013/Total-EU-Allocations-Per-MS-For-2007-2013/4taz-54g9/data>.

When looking at the data above, it is evident that it does not contain information on the regional breakdown. As a consequence, we will have to construct the different indicators for the effectiveness in the use of the CP based on the regional information provided in the first dataset above, that is, the DGRegio, Regional Policy, in its second section: Historic data on SF by MS: http://ec.europa.eu/regional_policy/EN/policy/evaluations/data-for-research/.

Although the CP funds include **the ERDF, CF and ESF**, the latter have very scarce data for the 2007-2013 period, many times not consistent with the data for the former two and with no regional disaggregation given. According to Gorzelak et al (2016), as a consequence of the division of the responsibility between DG REGIO (responsible for ERDF and CF) and DG Employment (responsible for ESF), the data collection was affected, making it difficult to elaborate a common regional database. This is why the ESF, although part of the CP, is not going to be considered in the analysis herein.¹

Before going into the detail on the statistical information available, it is worth noting that regional data available for the 2007-2013 period has increased substantially in comparison with previous programmes. There is information on both allocations and expenditures without the necessity of making estimations, as was needed in the previous period (2000-2006). In the document of the ERDF/DF 2007-2013 ex-post evaluation (European Commission, 2015b) you find information on the main limitations offered by the data, which have been summarized in Table 2.1.

To avoid repetition, for a detailed description of data that can be used to assess the implementation and performance of the CP for the 2007-2013 programming period across the European regions, look at the table provided in Gorzelak et al (2016, pp. 5-8). In our case, the rest of this section focuses explicitly in the data that have been used afterwards to construct the indicators in this chapter.

¹ For the new programming period, 2014-2020, the three funds are included as indicated in the *Open Data Platform*.

Table 2.1 Limitations and improvements in data to evaluate CP performance along time

	Data period 1994-99	Data period 2000-06	Data period 2007-13	Data period 2014-20
Limitations	<ul style="list-style-type: none"> • Only expenditures • Not consistency across MS • Objectives and Funds not separated • Expenditure typologies incompatible • No reliable regional breakdown 	<ul style="list-style-type: none"> • Still some important gaps at the regional level • Estimations needed for expenditure data in some cases 	<ul style="list-style-type: none"> • The quality of the indicators measuring the impact of the CP is limited (given the non-obligation of this monitoring tool) • Difficulty to assign regions to a particular operational programme • Different NUTS2 classification for allocations and payments 	<ul style="list-style-type: none"> • Too early. Only information on allocations and targets available
Improvements			<ul style="list-style-type: none"> • Data on allocations and expenditures available (without need of estimation) at NUTS level • Consistency improved (for 86 priority themes; 4 form of finance; 10 territorial types; 23 economic activities; NUTS system) • Monitoring of results with 40 core indicators for assessing the outputs of ERDF/CF 	<ul style="list-style-type: none"> • Change from 86 priority themes to 123 intervention fields • Typologies of forms of finance and of territorial dimension modified. • ESF included • Output indicators are compulsory: higher quality

Source: Own elaboration

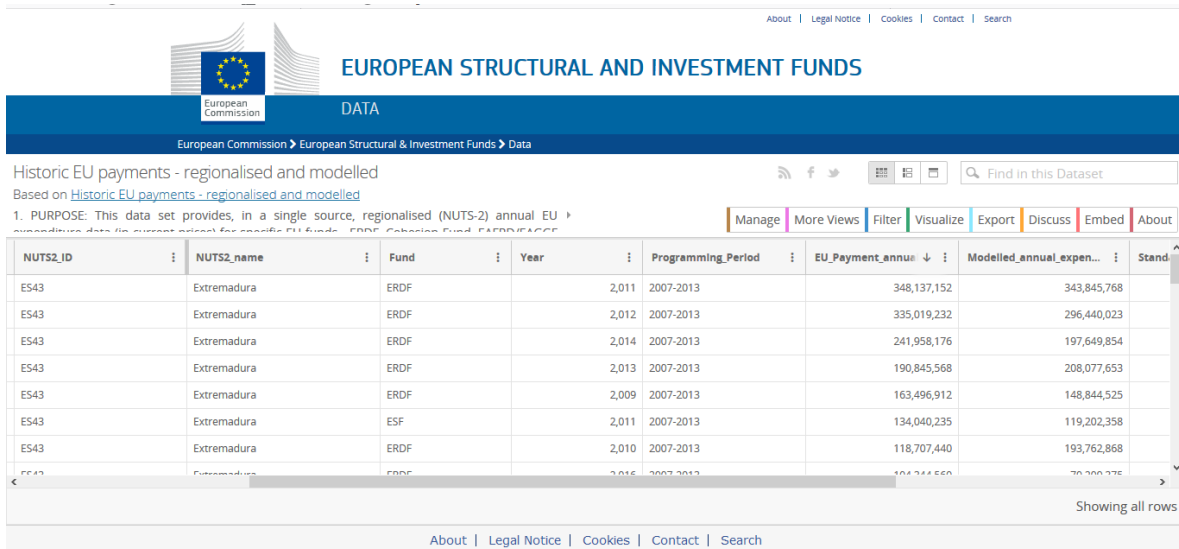
2.3.1. Data on SF payments.

In the dataset of the DG REGIO, under the level of Historic EU payments-regionalised and modelled,² you can find historic long-term regionalised (NUTS2) annual EU expenditure data for different EU funds - ERDF, Cohesion Fund, EAFRD/EAGGF and ESF. It covers 4 programming periods (1989-1993; 1994-1999; 2000-2006; 2007-2013), although it does not contain thematic information. We use this dataset to get the information on the most updated payments (until 2016), both real payment (column 'EU_Payment Annual') and annual expenditure modelled (column 'Modelled_annual_expenditure'). It allows knowing the year of

² <https://cohesiondata.ec.europa.eu/Other/Historic-EU-payments-regionalised-and-modelled/tc55-7ysv>

the payment, information needed in order to compute the measures suggested about the speed in the implementation of the CP along the programming period. Figure 2.1 plots an overview of the data included in such dataset:

Figure 2.1 Data on the historic EU payments regionalized and modelled



The screenshot shows the 'EUROPEAN STRUCTURAL AND INVESTMENT FUNDS' data portal. The table displays data for Extremadura (NUTS2_ID: ES43) across various years (2011-2016) and funding periods (2007-2013). The table includes columns for NUTS2_ID, NUTS2_name, Fund, Year, Programming_Period, EU_Payment_annual, Modelled_annual_expen..., and Stand... (likely Standardized Expenditure).

NUTS2_ID	NUTS2_name	Fund	Year	Programming_Period	EU_Payment_annual	Modelled_annual_expen...	Stand...
ES43	Extremadura	ERDF	2,011	2007-2013	348,137,152	343,845,768	
ES43	Extremadura	ERDF	2,012	2007-2013	335,019,232	296,440,023	
ES43	Extremadura	ERDF	2,014	2007-2013	241,958,176	197,649,854	
ES43	Extremadura	ERDF	2,013	2007-2013	190,845,568	208,077,653	
ES43	Extremadura	ERDF	2,009	2007-2013	163,496,912	148,844,525	
ES43	Extremadura	ESF	2,011	2007-2013	134,040,235	119,202,358	
ES43	Extremadura	ERDF	2,010	2007-2013	118,707,440	193,762,868	
ES43	Extremadura	ERDF	2,016	2007-2013	504,344,568	70,700,376	

In terms of the regionalisation of the EU payments made, this reference expands and replaces data sets previously published on the ERDF and CF with additional years and additional EU funds (European Commission 2015b).³

We find two columns with data on payments: a first one, labelled as 'EU_payment_annual' and a second one 'Modelling_annual_expenditure'. To understand the difference in both, it is signaled that the work undertaken to regionalise the payment data is predominantly based on the NUTS-2013 version as described in the final report in European Commission (2016c). In case the EU funded programmes covered more than one NUTS2 region, the regionalisation of the payments was carried out using either (1) regionalised data provided by the LMAs or (2) the application of certain apportioning rules to the payments in order to estimate the share of the payment by NUTS2 region, which is the value given in the first column. However, the yearly breakdown of the dataset follows the cycle of the European Commission payments to the MS and not the date on which real expenditures took place on the ground. This characteristic may negatively affect any subsequent analytic work to carry out policy assessments. In order to develop a more realistic estimate of the annual profile of real expenditure, the Commission

³ https://ec.europa.eu/regional_policy/en/policy/evaluations/ec/2007-2013/#1

developed a modelling of the real annual expenditure on the ground, which is what is offered in the second column.⁴

2.3.2. Data on SF allocations.

In the dataset of DG REGIO, under the level of Historic data on SF by member state and in the section of *'Geography of expenditure study, August 2015 (Ex post 2007-2013)'* you find the cumulative allocations to selected projects and expenditure at NUTS2.⁵ The information on the Allocated amount as well as the Expenditures for the whole programming period are offered both for 2013 and 2014, broken down for CF, ERDF and CF+ERDF (not for ESF) as well as for 86 priorities and for the 4 objectives of the CP (Convergence; Competitiveness; Cooperation; Multi Objective). In Annex 1 you may find the information available for the OP 2000-2006. Find in Figure 2.2 an overview of the information provided:

Figure 2.2 Data on SF allocations

Country code	Programme code	Title	Objective	Fund	Priority Cd	Location Cd	Nuts Level	Allocated 2013 EUR MILLION	Expenditures 2013 EUR MILLION	Allocated 2014 EUR MILLION	Expenditures 2014 EUR MILLION
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	02	AT11	2	0,00	0,00	1,65	0,66	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	03	AT11	2	0,07	0,07	0,07	0,07	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	04	AT11	2	3,56	1,50	4,44	2,20	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	05	AT11	2	0,42	0,37	0,45	0,43	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	06	AT11	2	1,94	0,87	1,85	1,85	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	07	AT11	2	14,10	8,68	16,10	11,17	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	08	AT11	2	54,62	47,15	60,94	56,17	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	09	AT11	2	7,50	7,50	7,50	7,50	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	14	AT11	2	0,93	0,49	1,24	1,08	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	41	AT11	2	0,83	0,04	1,31	0,04	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	43	AT11	2	1,13	1,05	1,12	1,05	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	57	AT11	2	3,73	2,66	3,90	3,15	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	59	AT11	2	3,26	2,53	3,63	3,15	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	60	AT11	2	3,82	3,32	3,82	3,79	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	81	AT11	2	1,46	1,07	1,72	1,33	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	85	AT11	2	2,20	0,99	2,20	1,26	
AT	2007AT161PO001	Ziel Konv 1- Convergence	ERDF	86	AT11	2	2,80	0,91	2,80	1,52	
AT	2007AT162PO001ionale Wett-	Competitiveness	ERDF	01	AT12	2	6,06	1,45	6,20	2,55	
AT	2007AT162PO001ionale Wett-	Competitiveness	ERDF	02	AT12	2	17,35	14,34	16,60	16,31	
AT	2007AT162PO001ionale Wett-	Competitiveness	ERDF	03	AT12	2	7,55	4,52	7,78	6,29	
AT	2007AT162PO001ionale Wett-	Competitiveness	ERDF	04	AT12	2	10,36	3,75	11,27	6,16	
AT	2007AT162PO001ionale Wett-	Competitiveness	ERDF	05	AT12	2	9,72	6,28	10,07	8,06	
AT	2007AT162PO001ionale Wett-	Competitiveness	ERDF	06	AT12	2	5,03	2,81	4,58	3,94	
AT	2007AT162PO001ionale Wett-	Competitiveness	ERDF	07	AT12	2	18,48	10,64	19,85	11,75	

2.3.3. Data on absorption rates and measures of speed in the implementation of the SF.

As commented before, the absorption rates in the ESIF Open Data Platform are given only at the national level. To compute the regional absorption rates we need to use the data on payments and allocations analysed in subsections 2.3.1 and 2.3.2. Depending on the information used, we can compute two different measures:

⁴ The modelled annual expenditure presented in the column 'Modelled_annual_expenditure' represents the mean of 100,000 simulations on the annual EU payments to estimate real expenditure.

⁵ For a detailed description, see European Commission (2015), where a full description on how the data were gathered and estimated is provided.

- a) The absorption rates can be computed with the data on allocation and expenditures as in the Geography of expenditure study (European Commission 2015b) which includes data on **allocations and expenditures updated until 2014**. They include information on ERDF and CF. As far as we understand, this is the information used in previous studies (e.g. Gorzelak et al 2016).
- b) We try to make a step forward and compute the absorption rate with the information most recently updated with corresponds to the **data obtained as the historic EU payments until 2016, which were updated in June 2018**.⁶ As commented above, the two values given for payments (the annual EU payments and the modelling of real expenditure) are different in each year but they coincide when you consider the information at the end of the period (2016). Thus, the absorption rate can be computed as the ratio between payments or modelled expenditures (which coincide in 2016) and the allocations in 2014.

The 2007-2013 dataset on payments is based on the NUTS-2013 Classification, whereas the allocations dataset is based on the NUTS-2010 version. To match both versions, we needed to make some adjustments.⁷

The main advantages and disadvantages of the absorption rates obtained with these two datasets are summarized in Table 2.2.

The absorption rates for ERDF and CF can present a different pattern, given that the latter are designed for infrastructure investments, which tend to be large projects with long planning and implementation periods, so that payments may be substantially lower than commitments. As a consequence, the degree of absorption in the case of CF programmes tends to be lower.

The Geography of expenditure study (European Commission 2015b) offers explanations of why allocations and expenditures may differ. It is commented that several programmes in the OP 2007-2013 showed a higher value of expenditures than allocations, especially the ERDF in Spain, where the difference between

⁶ In terms of the regionalisation of the EU payments made, this work expands and replaces previous data sets published on the ERDF and CF with additional years. As a consequence, this dataset provides the most complete historic picture available to date on the annual EU payments made under different shared management funds mapped to or estimated by NUTS2 regions.

⁷ The adjustments needed are provided in http://ec.europa.eu/eurostat/c/portal/layout?p_l_id=629283&p_v_l_s_g_id=0. For a more detailed explanation, see <http://publications.jrc.ec.europa.eu/repository/bitstream/JRC104030/jrc104030.pdf>.

expenditure and allocation can be found in the Spanish accounting system. According to the LMAs, while expenditure is invariable once it takes place, allocations are subject to revisions, which tends to be the case when the financial plan of a project is modified. “When this happened in a certain year, the cumulative data up to that year may show a positive expenditure but no commitment because the entire (revised) allocation to the selected project(s) is shifted to the next year when the new operation is approved. Due to the features of the accounting systems, there are cases of priorities and/or NUTS codes, in specific OPs, characterised by expenditures larger than allocations, even if the total OP expenditures are lower than total allocations, as we would expect” (European Commission 2015b, p.33).

Table 2.2 Advantages/disadvantages of computing absorption rates with data until 2014 and until 2016

	Absorption rates computed with information until 2014	Absorption rates computed with information until 2016
Advantages	<ul style="list-style-type: none"> • Consistent information: same regions for payments and allocations • Give place to absorption rates with higher variability than in the case of computing it with information updated (when the program is closed) 	<ul style="list-style-type: none"> • It contains the most updated information
Disadvantages	<ul style="list-style-type: none"> • It does not contain the most updated information 	<ul style="list-style-type: none"> • Inconsistent information: 19 regions in both datasets (the one for allocations and the one for expenditures) are different and cannot be matched perfectly • After the adjustments for matching both datasets (allocations and expenditures), the absorption rate happens to be higher than 1 in 22 regions (see a deeper description in subsection 2.4.2).

2.3.4. Data on monitoring information of the OP 2007-2013.

As a conclusion of the discussion above, it seems clear that a high absorption of the available resources is not a direct indication that the intervention was effective. Although beyond the main objective of this chapter, information on the ex-post evaluation is found in European Commission (2016), where the impact of the ERDF and CF are evaluated (total €269.9 billion). The ERDF and CF supported a wide range of projects from enterprise support to infrastructure, from urban

regeneration to culture and social infrastructure. In most countries, the sum of these two funds was equivalent to between 20% and 60% of government capital investment, a crucial contribution in a period including the economic and financial crisis (European Commission 2016).

To show the achievements of CP programmes, the European Commission designed a list of core indicators which are supposed to be the direct outcomes of supported projects. The idea is to measure them regularly at the project level and verify it by the programme level and by the European Commission. For the programming period 2007-2013, **the Management Authorities (Mas) reported the progress in implementation through the programme Annual Implementation Reports (AIR)**. The information tried to monitor how the programme was implemented, providing information on:

- Allocations decided and how they changed over time
- Amounts allocated to projects (project selection)
- Information on ERDF and CF achievements as measured by the use of core indicators:
 - Number of RTD projects
 - Number of cooperation project enterprises-research institutions
 - Research jobs created
 - Number of direct investment aid projects to SME
 - Number of start-ups supported
 - Jobs created in SME
 - Additional population covered by broadband access
 - km of new roads
 - km of TEN roads (new and reconstructed)
 - km of reconstructed roads
 - km of new railroads
 - km of TEN railroads (new and reconstructed)
 - km of reconstructed railroads
 - Additional capacity of renewable energy production
 - Additional population served by water projects
 - Additional population served by waste water projects
 - Area rehabilitated (km²)
 - Number of jobs created in tourism

However, again, the data available provides **only national values for outputs** under these 18 core indicators reported by over 300 ERDF/CF programmes across the EU. All in all, European Commission (2016b) estimates that €1 of CP investment during 2007-2013 will generate €2.74 of additional GDP by 2023. In absolute terms,

€346.5 billion were invested in 2007-2013, and the estimated return nearly €1 trillion of additional GDP by 2023, plus 1 million jobs. According to the report, every region and country in the EU benefits from CP, via the direct effects of the investments and/or the indirect effects like increased trade. EU CP investments in 2007-2013 were a vital source of finance for many countries, representing up to 57% of government capital investment in Hungary.

Despite the results of the econometric models pointing to the conclusion that CP investments had positive and tangible results ranging from job creation, positive impact on regional disparities and an increase in GDP, the own European Commission states that some programmes were not focused enough on the results to be achieved in the OP 2007-2013. This led the 2014-2020 programmes to have stronger result-orientation to ensure that taxpayers' money is spent efficiently. The main areas signaled for improvement were:

- Investment concentrated on key themes, important for citizens' lives.
- Projects applying for EU funds will have to explain clearly, upfront, how they aim to reach their targets.
- Stronger monitoring will track progress towards targets and evaluation will assess impact of the programmes.

As a consequence, for the period 2014-2020, the information contained in the AIRs is given at the regional level since the EC is focused on the results or achievements of the funds and no more in the absorption rate as a measure of the effectiveness in the use of the funds.⁸

2.4. Regional variation in the CP effectiveness of the OP 2007-2013.

From the revision made to previous literature and empirical evidence on the analysis of the effectiveness in the use of the Cohesion Funds, we observe that little emphasis has been put in analysing the variation of such effectiveness across regions in the EU, which is what is meant to be done in this chapter. With such objective, we will use different measures to proxy for the effectiveness in the absorption of the SF:

- Allocations and expenditures
- Absorption of the funds
- Speed in the payments along the programming period

⁸ The European Commission (DG REGIO) has used QUEST and HERMIN models for the evaluation of the CP at the level of EU MS, while the RHOMOLO models developed by the DG REGIO and Joint Research Centre-Institute for Prospective Technological Studies produces results at the level of EU NUTS 2 regions (López-Rodríguez and Faíña 2014).

2.4.1. Regional variation in allocations and expenditures.

To analyse the scale of the CP in the different EU regions, Figure 2.3 offers the regional distribution of **allocations** of ERDF and CF in per capita terms in the 2007-2013 period. Among the main beneficiaries we find all the regions of Slovakia, Hungary, Czech Republic (except Praha) and Greece (except Athens) as well the uniregional countries of Estonia, Latvia, Lithuania and Malta. They are followed by some Eastern regions of Poland (5 regions out of 16) and Portugal (5 out of 7), the Eastern Slovenian region of Vzhodna Slovenija, the region of Extremadura in Spain and Calabria in Italy (all of them with values above 1,700 euros per capita for the period). All in all, this shows how the regions receiving more funding correspond to those that are eligible for receiving assistance from the Cohesion Policy. In a second level, we find most of the regions in Romania and Bulgaria, Cyprus, regions in Southern Italy, Eastern Germany (except Berlin) and several Spanish regions (except the ones in the North-east and Madrid). In the remaining regions, the allocation is substantially lower and reflects the pattern of more developed vs less developed regions in most of the countries.

Figure 2.3 Allocations per capita. ERDF+CF in OP 2007-2013

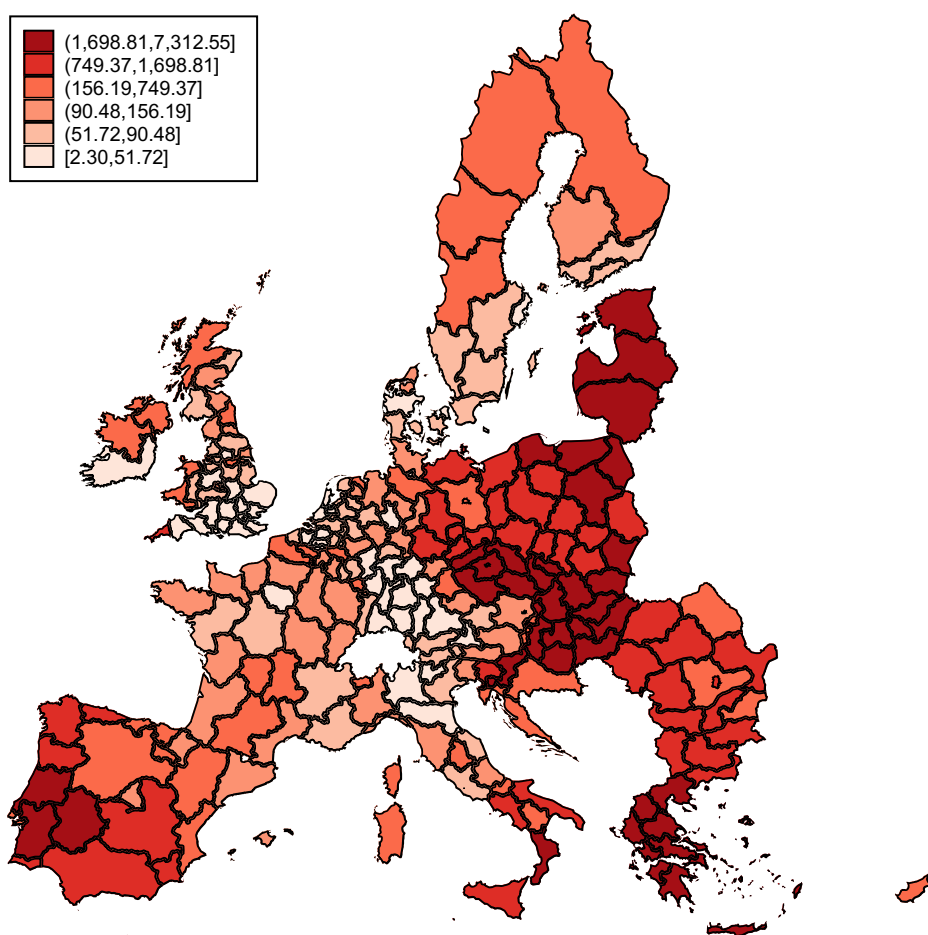
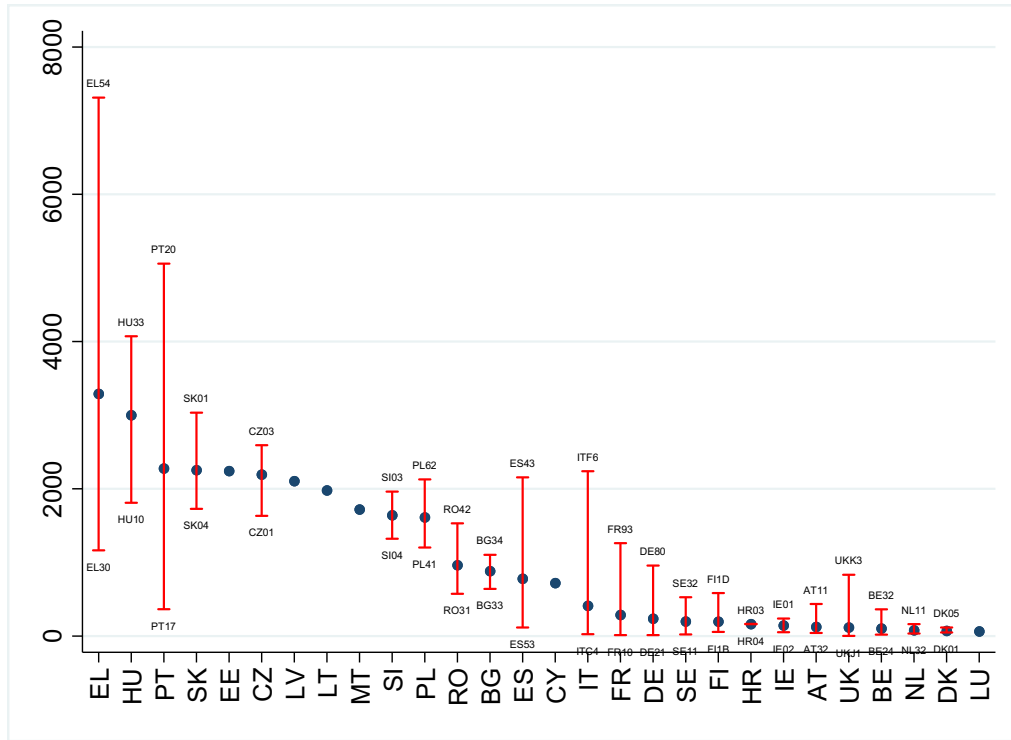


Figure 2.4 shows the regional variation of allocations within and across countries, using a simple method of ‘minimum–maximum’ comparison.⁹ Interestingly, it is noteworthy to mention that the within-country variation is in many cases more important than cross-country variation. Again, the regions receiving the highest funding in per capita terms follow the funding eligibility which is directly linked to its regional convergence objectives, which are based on two groups of areas, namely less developed versus the more developed regions. However, two main additional comments are worth highlighting. First, in general, the more developed countries of the EU do not only show very little values of funding per capita, but they also present a very little regional within-country variability. The only exceptions would be the regions of Cornwall (UKK3) and West Wales and the Valleys (UKL1), Mecklenburg-Vorpommern (DK80) as well as the ultramarine regions of France (FR91, FR92, FR93 and FR94). In the rest of the core countries, such as the Scandinavian ones plus Ireland, Austria, Belgium and The Netherlands, the regional variation within each of them is minimal. Second, the highest regional variability is observed in Greece, Portugal and Hungary, which also present the highest average funding per capita. Italy and Spain also present very high regional variability within each case, although with values of funding per capita much lower than in the previous cases.

As indicated in the European Commission (2016b) document, over 90% of the funding available from the ERDF and CF for the 2007-2013 period had been paid by the end of March 2016 to member states, which, since 5% of such funding is held back until the expenditure is formally approved, implies being close to full absorption. In any case, given that allocations and expenditures do not coincide, and that the data on expenditures were updated until 2016 (whereas allocations refer to 2014), we present the spatial distribution and the regional variability for the **expenditures** in per capita terms to see if there are significant differences in the regional distribution of allocation and expenditures. As argued in subsection 2.3.1, we have these data updated as for 2016 and 2014. Given the higher accuracy of the former, these are the ones commented. In any case, given that the changes between these two years can also be of certain interest, the reader can find the corresponding figures for 2014 in Annex 2.2.

⁹ As signaled in Charron et al (2014, p.89), “although minimum–maximum is sometimes overly simplistic and can overlook variation within the minimum and maximum regions, it is worth noting that when this was compared with other measures of within regional variation, ..., such as a Gini index, the coefficient of variation and the Thiel index, it was found that all measures correlate very highly (a Spearman rank correlation of 0.85 or higher) with the measure of minimum–maximum”.

Figure 2.4 Regional variation of allocations pc. ERDF+CF in OP 2007-2013



Figures 2.5 and 2.6 basically reproduce the spatial patterns observed for allocations with only very minor changes. In fact, the main difference to highlight is the lower amount of funding that is paid if compared with the one allocated, but there is no change in its spatial distribution. The only remarkable fact when analysing the regional variation within each country is that some regions in Greece (Central Macedonia EL52) and Portugal (the metropolitan area of Lisbon, PT17) present a very little amount of payments made at the end of 2016 if compared to the allocations they had. In any case, the risk that the full amount of funding is not absorbed is made explicit in the computation of the absorption rate as commented in the next subsection.

Figure 2.5 Expenditures per capita. ERDF+CF in OP 2007-2013 (update 2016)

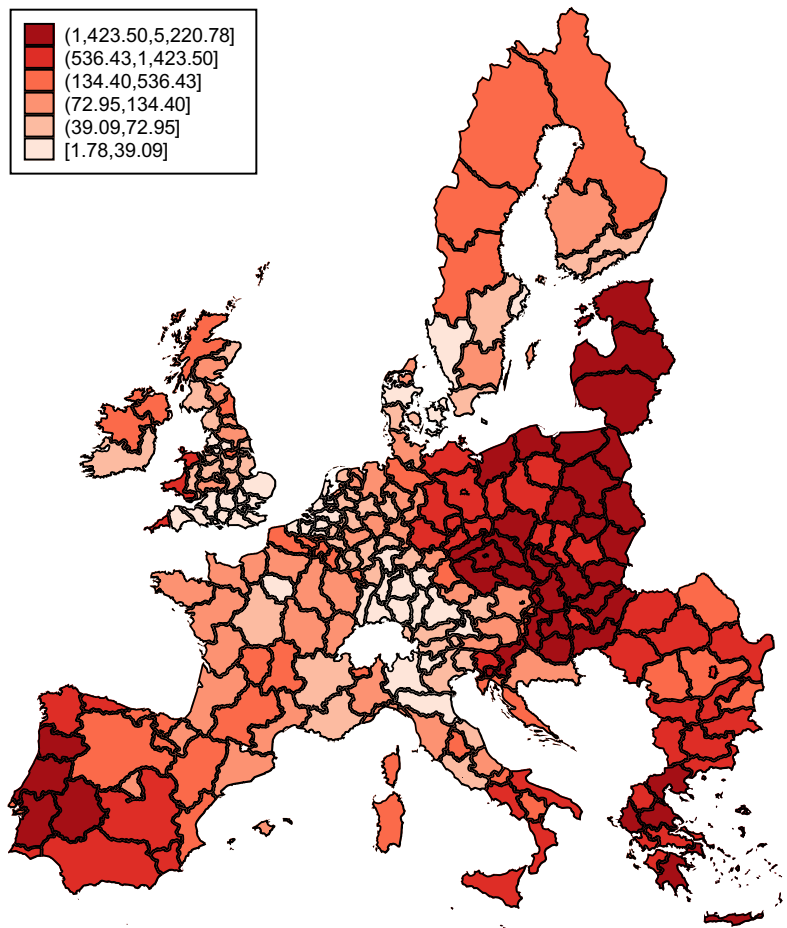
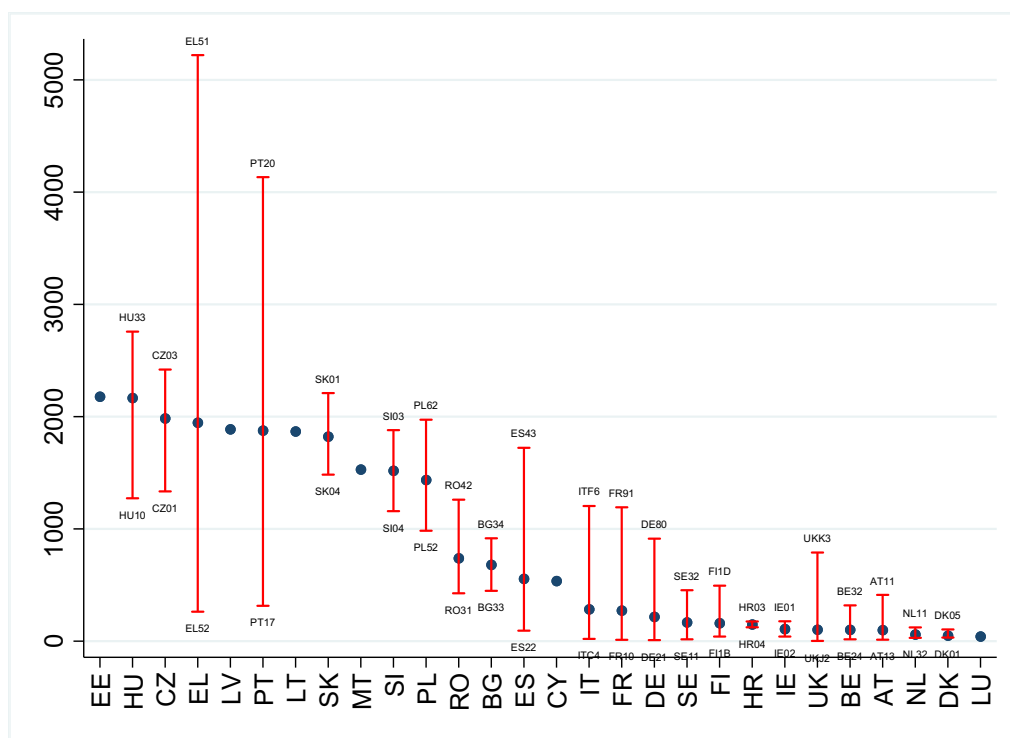


Figure 2.6 Regional variation of expenditures pc. ERDF+CF in OP 2007-2013 (updated 2016)



2.4.2. Regional variation in absorption rates.

As commented in subsection 2.3.3, the regional absorption rates have been computed with data on expenditures respectively updated until 2014 and 2016. Consequently, the regional variation is analysed using both measures.

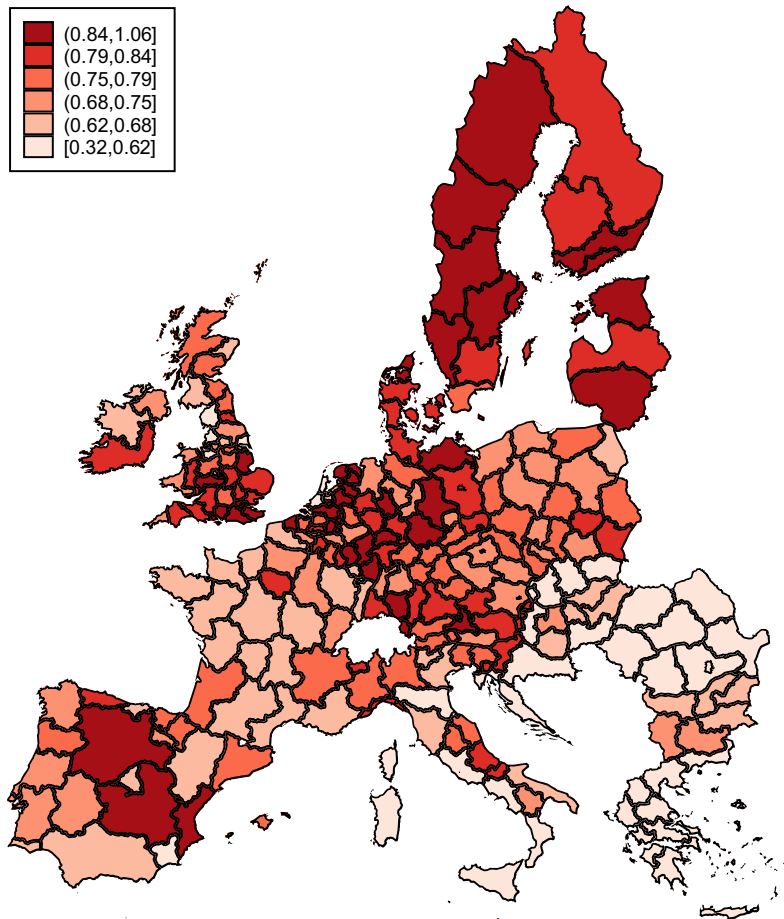
A. Absorption rates computed with expenditures updated until 2014

With the data available until 2014, two regions present absorption rates slightly higher than 1: the region of Herefordshire, Worcestershire and Warwickshire in the UK (UKG1, with a rate of 1.06) and the Dutch region of Overijssel (NL21, with a rate of 1.01). Looking at the detail of the data for those regions, the mismatch is caused by certain priorities of the operating program for such regions, where the cumulated expenditure increased from 2013 to 2014, without changing the amount allocated. This gives rise to an absorption rate for that priority higher than 1. It would be desirable that this type of information was more accurate, otherwise one gets a distorted image. The solution would come from checking the allocated amount at the end of the period, when the expenditures have finished. However, this information is not publicly available.

Leaving apart these two cases, according to Figures 2.7 and 2.8, we observe that an absorption rate of 100% is never accomplished. In the case of Malta it is almost so (99%) and 15 additional regions present an absorption of allocated resources higher than 90%. This group includes seven Dutch regions, four German, two British and one Swedish (Stockholm SE11) and Austrian (Luxembourg AT34). The lowest absorption rates are presented in the two regions of Croatia (32% and 36%) as well as seven Romanian regions (out of 8), with rates in between 32% and 44%. Also two Italian regions (Campania ITF3, and Calabria ITF6), three Greek (West Makedonia GR13, West Ellada GR23 and Creta GR43) and one Spanish (Melilla) present rates in between 44% and 50%. The average absorption rate is 73%, observing that most of the regions have absorption rates between 60% and 75%. The Scandinavian countries tend to have high absorption rates (Sweden, Finland, Denmark), which in the Gorzelak et al (2016)'s report is said to be due to their good quality of government. Although this is probably a possible reason, according to our conversations with the LMAs, it could also be related to the low amount of allocations they receive because of their high level of development, which would make it easier for the local authorities to manage the funding. In a similar manner, the regions and countries with very low absorption rates tend to be regions/countries with high amount of allocations, making it more difficult to manage the funds. This could be the case of Romania and Greece. However, there are exceptions to this difficulty in dealing with massive funds, since regions in some Baltic countries and in Spain present high levels of allocations with high

absorption rates. On the contrary, Croatia presents very low absorption of resources with little funding.

Figure 2.7 Absorption rates. ERDF+CF in OP 2007-2013 (updated 2014)



Finally, it is interesting to highlight that the highest regional variations in absorption rates are observed in the UK, followed by the Netherlands, Spain and Italy, with regions close to the full absorption together with regions that have absorbed less than 50% of the allocations until 2014.

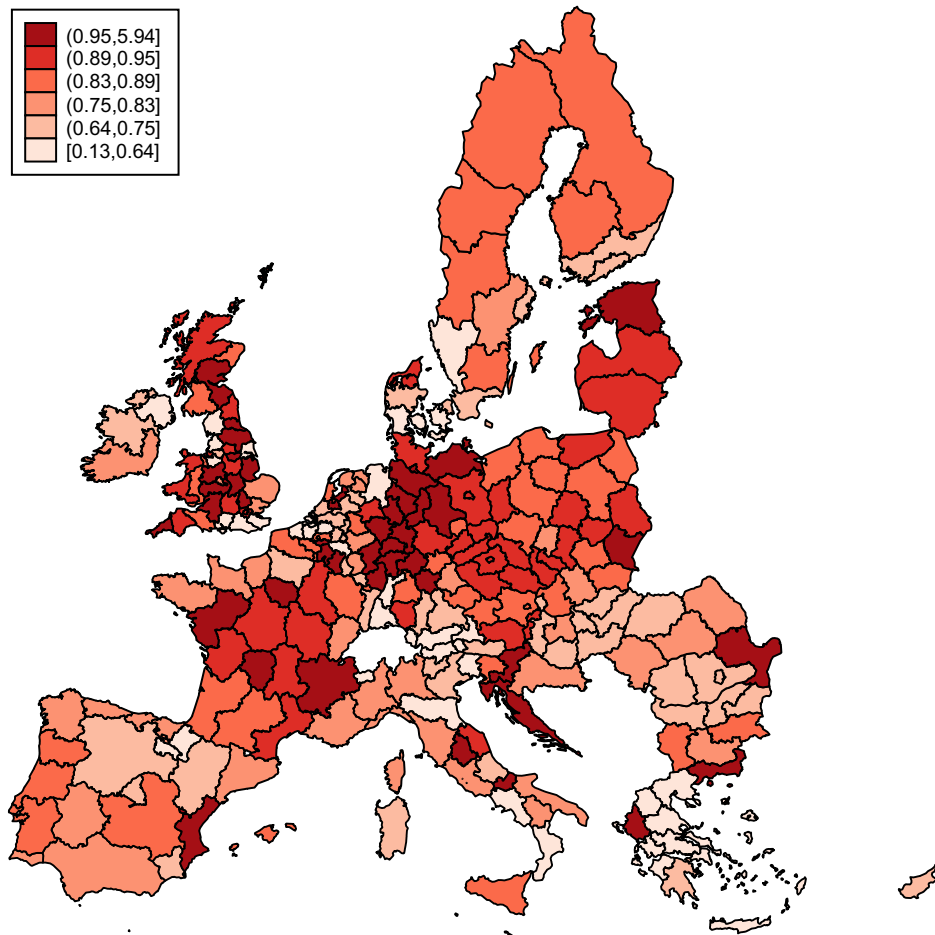


¹⁰ These regions are (the values of the absorption rates given in parentheses): Brabant Wallon (5.94), Luxembourg (2.00), East Makedonia (1.88), Thessalia (1.58), Namur (1.45), Herefordshire, Worcestershire and Warwickshire (1.36), Guadeloupe (1.33), Braunschweig (1.30), Koblenz (1.21), Gießen (1.11), Detmold (1.11), Trier (1.09), Flevoland (1.08), Adriatic Croatia (1.06), Kassel (1.06), Rhône-Alpes (1.03), Darmstadt (1.02), South Yorkshire (1.02), Limousin (1.01), Utrecht (1.01), Lincolnshire (1.01) and Tees Valley and Durham (1.00).

region or another after the program period is closed. Although it would be good to have information on these issues, unfortunately, this goes beyond what is in our hands with the information available online.

Next, we analyse which is the level of correlation between the absorption rate computed with data until 2014 and the one in 2016. We have computed it for the 253 regions for which there is an exact matching in both NUTS2 classification (2006 and 2010) and we observe that it is surprisingly low (0.10). If we assume that the values for expenditures are much more accurate in 2016, we get that the picture obtained in 2014 is far from reality. Thus, Figure 2.9 offers the spatial distribution of the absorption rates with the information updated until 2016. Indeed, we observe important changes in the ranking of the rates of absorption between 2014 and 2016.

Figure 2.9 Absorption rates. ERDF+CF in OP 2007-2013 (updated 2016)



Again, we observe an important national variation in the rate of implementation. At the end of 2016, Greece had only claimed 67% of the funding for the period (48% if we discard the two regions with an absorption rate anomalously higher

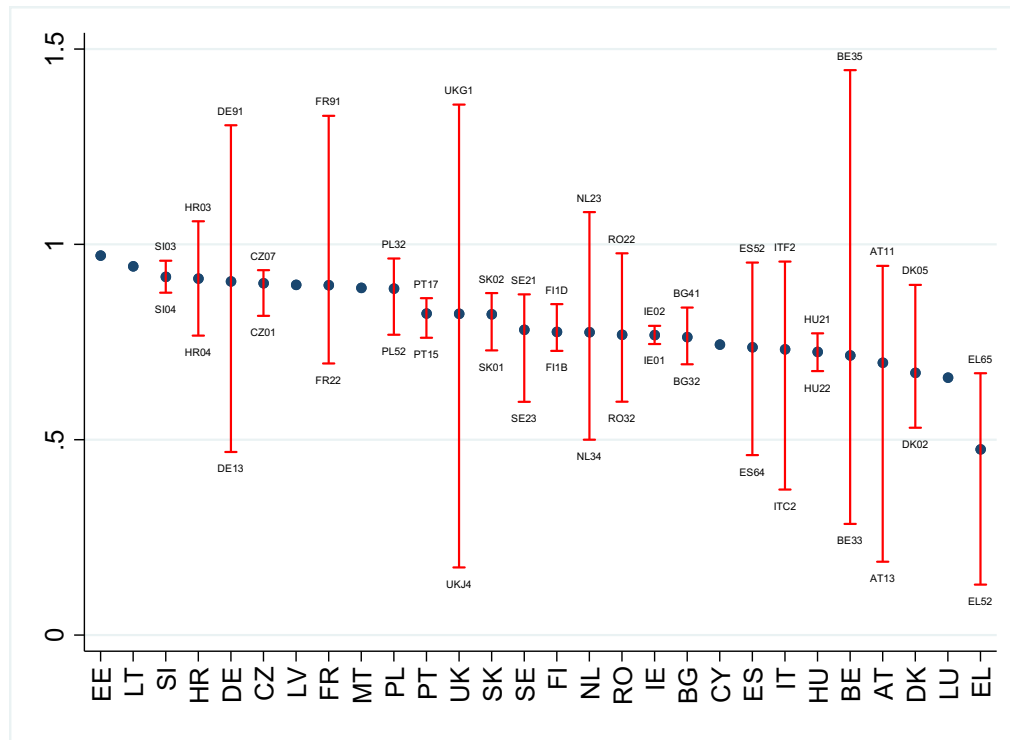
than 1.5), and Luxemburg reports 66%, values much lower than in the rest of the countries. They are followed by Denmark (67%), Austria (70%), Belgium (131% if all regions are considered and 72% without the two regions with absorption rates higher than 150%), Hungary (73%), Italy (73%), Spain (74%) and Cyprus (74%), all of them with shares lower than 75%. On the contrary, Estonia (97%), Lithuania (94%), Slovenia (92%), Croatia (91%), Germany (91%), Czech Republic (90%), Latvia (90%), France (89%), Malta (89%) and Poland (89%) presented shares over 89% in 2016.

It is difficult to extract conclusions on the reasons behind the national pattern observed, since very different countries are in both groups (the highest and the lowest values for absorption of the funding). One possible explanation of this high heterogeneity could be related to the fact that the absorption rate depends on cultural factors as well as administrative structures (Gorzelak et al 2016). However, the regional variability within each country is also very high, a fact which is especially true for some of the more developed economies in the EU (see Figure 2.10). Indeed, the highest within-country differences of the absorption rates among different regions are observed in the UK, Germany, Austria, France, Italy, Netherlands and Spain. This variability is very low, though, in the case of the Scandinavian countries and most of the Eastern countries.

All in all, a well-defined fact is that fully absorption in the OP 2007-2013 was more the exception than the rule. The low absorption rates can be thought to be related to the crisis that most European economies suffered during most of the OP, which may have implied delays due to the inability to carry out planned payments because of troubles of getting the co-funding or because of investments being deferred in the framework of the insecurity produced by the crisis. However, the LMAs also had the opportunity to compensate the economic recession by growing the rate of implementing programmes. As a consequence, the economic cycle could have influenced the absorption rate in both directions.

In any case, as previously commented, according to the European Commission (2016b), more importance was indeed given to absorption instead of how effectively the funds contributed to the accomplishment of policy purposes, which implied that the LMAs interviewed in such document concluded that the absorption of funds was regarded as a vital aspect of project selection.

Figure 2.10 Regional variation of absorption rates. ERDF+CF in OP 2007-2013
(updated 2016)



Note: Regions with absorption rates higher than 1.5 not included: Brabant Wallon (BE, 5.94), Luxembourg (BE, 2.00), East Makedonia (EL, 1.88), Thessalia (EL, 1.58).

2.4.3. Regional variation in the speed of the payments along the programming period.

In the design of the measures suggested in subsection 2.2.2 with respect to the speed of the payments made along the programming period, we have taken into account that although it goes from 2007 till 2013, the expenditure took place until 2016. That is, a total duration of 10 years. The six indicators suggested, have been computed both with the historic data regionalised and modelled as provided in the webpage.¹¹ As commented in subsection 2.3.1, although these two measures coincide when you consider the information at the end of the period, they are different in each year, and given that this is the information we are using here, we have computed them in both cases. However, the explanation below is based on the modelled data, which tends to be more reliable yearly. The figures based on the EU annual payments can be found in the Annex 2.3. Again, we offer the maps of such measures to show their distribution in the space as well as the figures that offer their within-country regional variation.

¹¹ Historic data on SF: http://ec.europa.eu/regional_policy/EN/policy/evaluations/data-for-research/.

Figure 2.11 shows the within-country regional variation of the share of spending accumulated in the first 3 years of the operating programme. One could argue that a high share could be an indication of having most of the projects clearly defined from the beginning as well as a good work from the LMAs. Most of the regions accumulate between 10% and 20% of the expenditure in the first 3 years with a limited regional variation (less than 8 p.p. of difference between the highest and lowest values in each country). Austria (Steiermark 26% vs Oberösterreich 14%), Germany (Mecklenburg-Vorpommern 36% vs Saarland 9%) and UK (East Wales 36% vs Highlands and Islands 12%) are the countries with the highest regional variations, followed by Italy, Spain, France and Portugal.

After 5 years from the beginning of the programming period, most of the regions already absorbed in between 30% and 50% (see Figure 2.12). As exceptions in the upper band and with values higher than 60%, we find the Swedish region of Stockholm, the Spanish La Rioja, the German Bremen, and Poitou-Charentes in France. On the opposite side, the regions accumulating less than 20% of the expenditures in the first 5 years are the two Croatian regions and Saarland (Germany). The highest regional variations within countries are observed in Germany, France and Italy.

Figure 2.11 Share of expenditures in the first 3 years of the OP 2007-2013

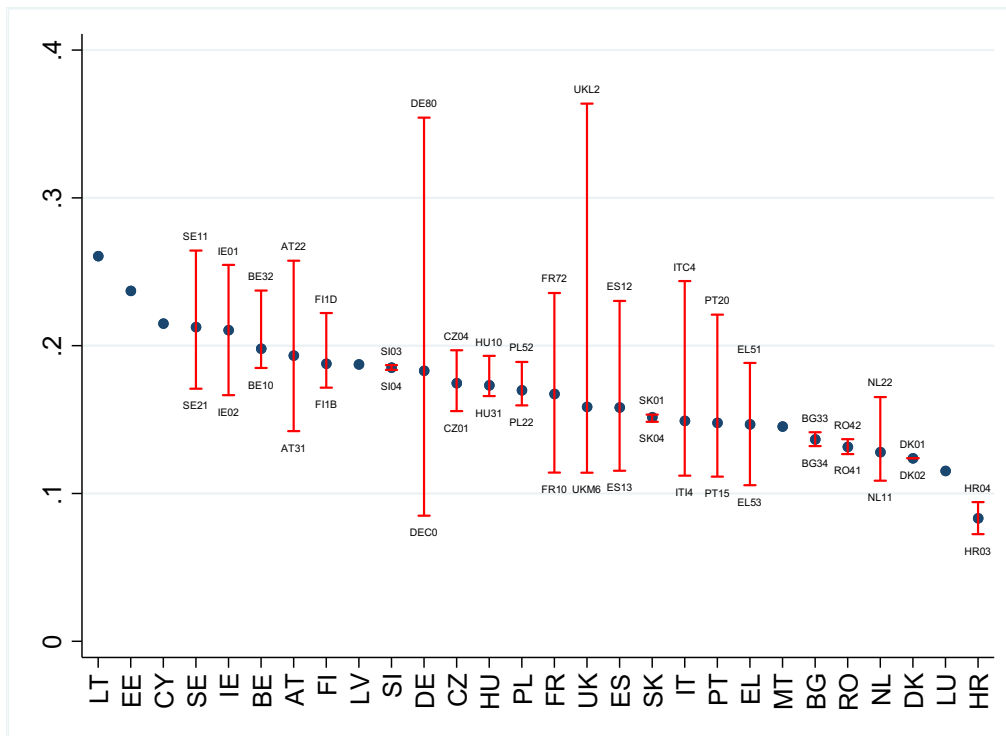


Figure 2.12 Share of expenditures in the first 5 years of the OP 2007-2013

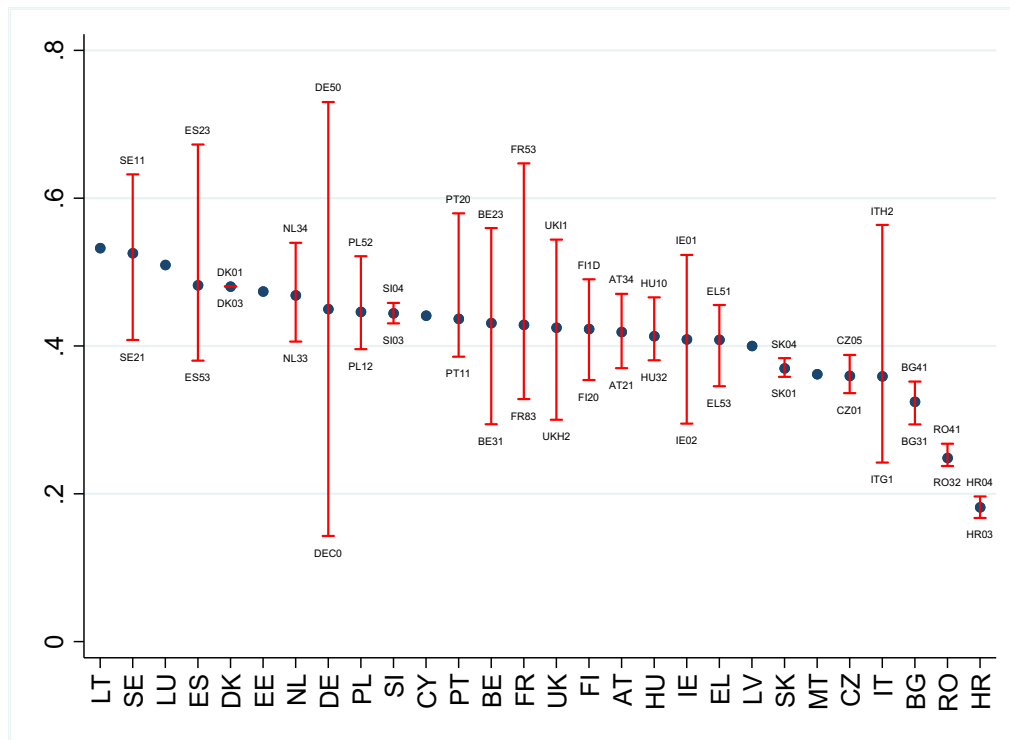
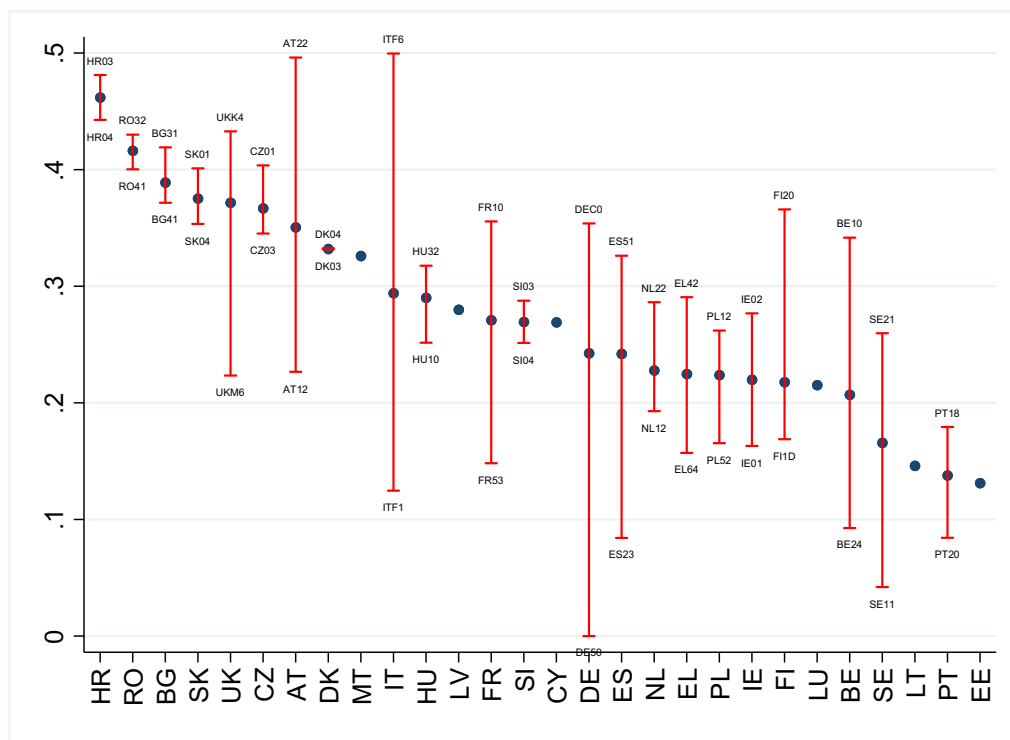


Figure 2.13 Share of expenditures in the last 3 years of the OP 2007-2013



Under the hypothesis that expending an important share of the funds in the last years of the programming period could be a potential indication of a bad implementation of the funding, we observe in Figure 2.13 that some regions in Austria, Croatia, Italy, Romania, UK and Bulgaria present a share of allocation spent in the last three years higher than 40% (which represents 2014-2016 in most of the cases, although some regions finish in 2015), an important magnitude. Again, the highest variations are obtained for Germany and Italy, with the region of Bremen not making any expenditure at all and the region of Saarland spending 35% in the last 3 years. Similarly, the region of Abruzzo spends 12% whereas Calabria's expenditure in the last 3 years amounts 50%. With little regional variation and accumulating more than 35% in the last 3 years in all the regions are Bulgaria, Czech Republic, Croatia, Romania and Slovakia, all of them being Central and Eastern European countries. The rest of the countries spend in between 10-30% in the last 3 years with a regional variation within the country of around 15 p.p.

Looking at Figure 2.14 we observe that the number of years needed to accumulate the 25% of the payments tend to be in between 4 and 5 years from the beginning of the programming period (2010-2011), a range for all the regions in most of the countries. On the lower band, Lithuania as well as all the regions in Austria and Sweden only need between 3 and 4 years, whereas on the upper band, all the regions in Croatia, Romania and Bulgaria as well as Malta need 5 or more years. As for the regional variation, it must be said that it does not seem to be extremely important, given the small number of years we are considering. In any case, the countries with the highest variation are Germany (with the region of Lüneburg needing only 3 years and the region of Saarland needing 6 years) followed by Italy, Ireland and UK whereas many countries with multiple regions present very little variation (Bulgaria, Denmark, Spain, Finland, Hungary, Poland and Slovakia). It must be pointed out that if compared with the plots obtained when the data considered are the EU annual payments (non-modelled), the regional setting does not differ substantially from what has been described so far, but there is a higher maximum value for the number of years needed to accumulate the 25% of the payments which amounts the value of 7-8 years in some cases (see Annex 2.3).

Looking at the figure that shows the number of years needed to accumulate the 50% of the payments (Figure 2.15), it is worth highlighting that are needed in between 5 and 7 years (2011-2013) and the different ranking of the countries: Austria is no longer in the lower band and now we find Spain and Germany (the latter already present in the Figure above) with La Rioja and Bremen, respectively, needing only 4 years. In the upper band, needing 7 years we find all the regions in Bulgaria, Romania and Croatia as well as Malta (the latter being mono-regional).

The highest regional variations are presented again by Germany followed by Italy and UK (as in the figure above) as well as Belgium, Spain and France. Again, in the case of non-modelled payments, the values are higher (9 years needed in some regions), but the pattern is not very different from the one with modelled data (see Annex 2.3).

The 75% of the funds are paid between the 6th and the 9th year (2012-2015) (see Figure 2.16). The countries with regions needing only 6 years are Belgium, Germany, Spain, Portugal and Sweden; whereas the regions taking 9 years belong to Austria, Croatia, Italy and UK. With the exception of Portugal and Croatia, all the countries signalled above are the ones presenting a higher regional variability, with two years of difference between the regions needing more and less years to reach the 75% of the payments.

As expected, the share of expenditures accumulated after 3 years of implementation of the programme is negatively and significantly correlated with the number of years needed to accumulate 25% of the total expenditure (with a coefficient of correlation of -0.56, p-value: 0.00). The same happens with the share of expenditures accumulated after 5 years of implementation of the programme and the number of years needed to accumulate 50% of the total expenditure (with a coefficient of correlation of -0.85, p-value: 0.00). Also as expected, a positive and significant coefficient of correlation is found between the share of expenditures accumulated during the last 3 years of implementation of the programme and the number of years needed to accumulate 75% of the total expenditure (with a coefficient of correlation of 0.85, p-value: 0.00).

We can conclude that the rate of implementation in the OP 2007-2013 was relatively slow. In fact, the European Commission (2016b) signals that it was even slower than in the previous OP (2000-2006), which itself had a slower absorption rate than in the period before. Of course, one reason for the slow rate of absorption has something to do with the delay in spending the funding from the previous period. This implied that the staff was trying to guarantee that the 2000-2006 funds were absorbed, which in some cases could take till the end of 2009 thanks to the extension in the period in which funding could be spent. Another reason of this slow absorption may be found in the financial and economic crisis, which would have made more difficult to find co-financing resources. In any case, it seems that a number of countries and regions increased the absorption of the funds in the later years, probably not to lose the funding by March 2016.

Figure 2.14 Years needed to accumulate 25% of expenditures

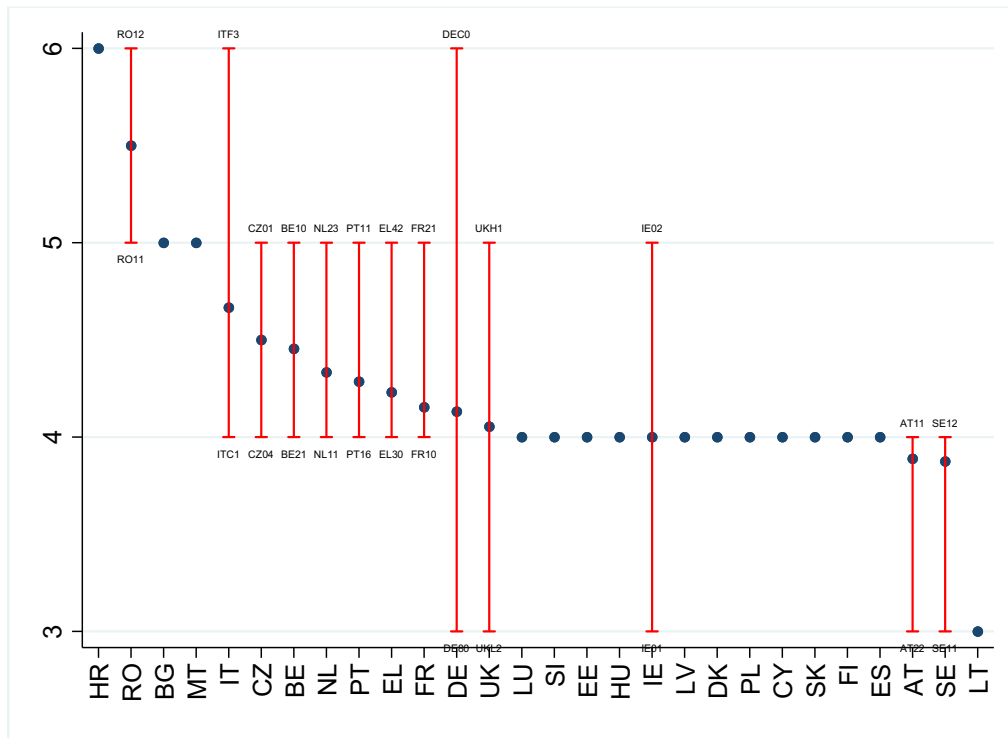


Figure 2.15 Years needed to accumulate 50% of expenditures

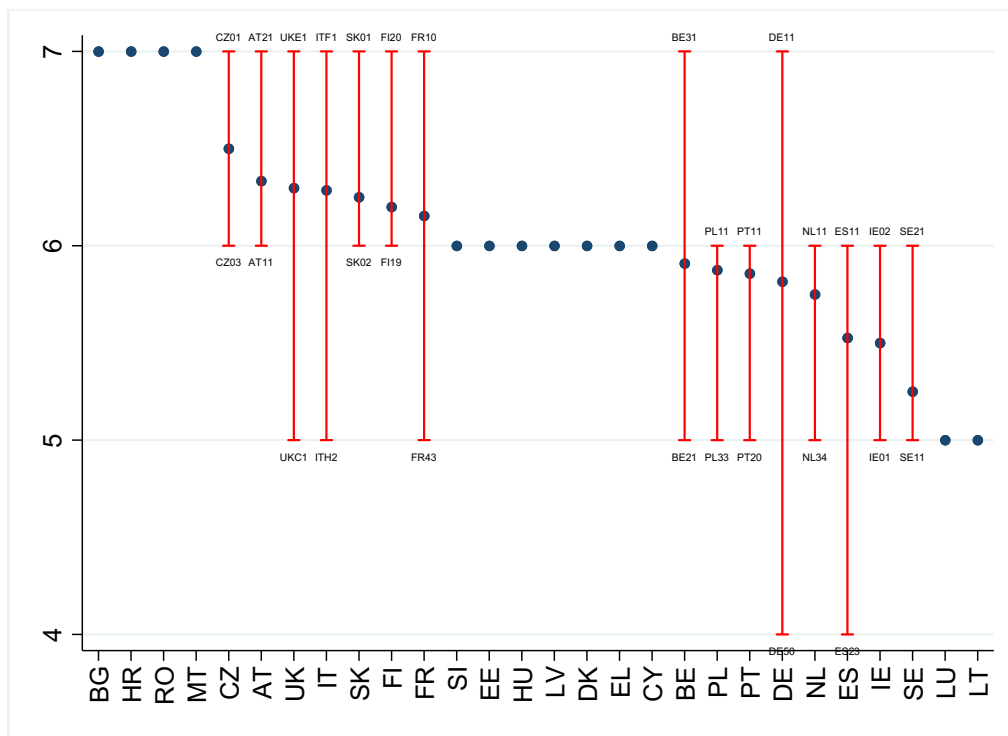
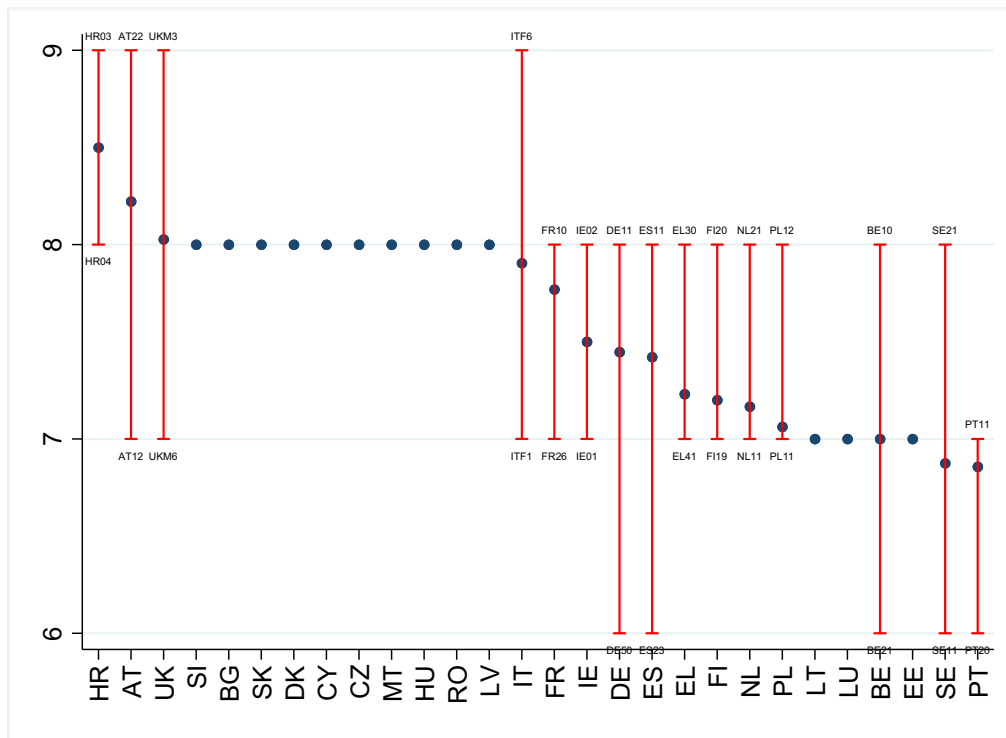


Figure 2.16 Years needed to accumulate 75% of expenditures



2.4.4. Correlation between the effectiveness in the implementation of the CP and key economic magnitudes.

We turn now to study the correlation of the main efficiency and effectiveness measures analysed above with some key economic magnitudes at the regional level. As observed in Table 2.3, the amount of allocations per inhabitant as well as expenditures per capita are highly and negatively correlated with the level of development in the regions proxied by the Gross Domestic Product per capita, the share of population between 25 and 65 years with tertiary education and the share of employment in high-tech sectors. Similarly, the rate of long-term unemployment is negatively and significantly correlated with expenditures and allocations. This pattern results from the main objective pursued by the CP of diminishing territorial disparities across regions of Europe.

More interesting is the analysis of whether those regions with higher income and higher endowments of human and technological capitals are the ones presenting higher rates of implementation of the SF. This is only partially true. Those regions with higher human capital and higher specialization of labour in high-tech sectors seem to show higher shares of absorption of the funds. However, having a higher GDP per capita or lower levels of unemployment does not imply a higher share of absorption. Looking at the measures of the speed in the implementation of the programme, the clearest relationship is observed with the level of income, since

those regions with higher GDP per capita tend to be those with a higher expenditure in the initial 5 years (and correspondingly, a lower share in the last 3 years and lower number of years needed to get the 50% of the total expenditure). In any case, none of these correlations are very high (all of them lower than 0.24), so that it is risky to conclude that there exists any clear pattern between the effectiveness in the implementation of the CP and some of the main variables proxying for the economic development of a region.

Table 2.3 Correlation between CP effectiveness and key economic magnitudes at the regional level

	Payment pc	Allocation pc	Absorpt rates	Share in 5 years	Share in last 3 years	Years until 50%
GDP pc	-0.64***	-0.64***	0.01	0.26***	-0.11*	-0.15**
High education pop (%)	-0.43***	-0.44***	0.12*	0.24***	-0.01	-0.10
High-tech employment (%)	-0.13**	-0.13***	0.13**	-0.02	0.09	0.07
Unemployment	0.23***	0.27***	-0.05	-0.09	-0.05	0.04

Note: Coefficients of pairwise correlation obtained with the sample of 272 NUTS2 EU regions. *, ** and *** indicate significance at 10%, 5% and 1%, respectively. Economic magnitudes refer to 2015.

2.5. Case study regions: Detailed analysis of the effectiveness in the implementation of the CP.

In this section we plan to focus on the 9 regions under study in the PERCEIVE project and analyse their effectiveness in the implementation of the CP in light of the results previously obtained for them. However, as it has been observed in the previous section, there are deficiencies in the publicly available data that have allowed us to compute alternative measures of the effectiveness in the use of the Cohesion funds, which is specially the case for the computation of the absorption rates. In this sense, for the elaboration of Task 6.1 in the PERCEIVE project, with the aim of generating a model to be processed through simulation in order to develop a scenario analysis, the absorption rates for the 9 regions under analysis in this project were obtained more specifically than we did so far in this report. The data used in such task are obtained from the annual PDF reports by each fund and period, so that all the data were collected and gathered in time series for each of the 9 regions under study. The aforementioned data refer to the ROP (Regional

Organisation Plan) commitments and the payments that the EU gives to the regions, without taking into considerations the national/regional co-finance. This could be obtained for all the regions with the exception of Sud-Est (Romania) and Essex (UK). Therefore, in this section we plan: i) to compare the absorption rates obtained for the 7 regions with both datasets in order to highlight the deficiencies encountered when working with the publicly available data; and ii) to analyse the effectiveness of the implementation of the CP in the case study regions with the information contained in both datasets in light of the results obtained previously in the project.

2.5.1. Comparison of the rates of implementation of the funds with the PERCEIVE and the public datasets.

The data offered in Task 6.1 is only for the ERDF and the ESF, whereas the publicly available database refers to ERDF and CF (without considering the ESF for which it was not always possible to have information). As a consequence, the comparison we make in the remaining of this subsection can only be done for the case of the ERDF.

Figures 2.17 and 2.18 show the evolution in time of the absorption rates in these 7 regions according to the two datasets. There is a common increase in such measures with an absorption of the funds higher than 50% in between the years 2011-2013 (except for the case of Calabria and Emilia Romagna). However, after this point in time, whereas the absorption rates are always above 90% in 2016 when the PERCEIVE data are considered, this is not the case with the public data (with the Italian regions presenting ARs lower than 62%). As for the ranking of the regions, there are also important differences. Although Calabria is the region performing the worst in both cases, the ones performing better with the PERCEIVE data are Norra Mellansverige (SE) followed by the two Polish ones, Warmińsko-Mazurskie and Dolnośląskie. In the case of using the public data, the quickest region in absorbing the funds is Burgerland (AT) followed by Dolnośląskie (PL).

All in all, several conclusions are worth highlighting:

- The absorption rates computed with the data obtained from the PERCEIVE dataset arrives until 2018, implying more updated information on both expenditures and allocations
- As a consequence of the point before, the absorption rates with the PERCEIVE dataset are higher than with the public dataset
- The differences in the absorption rates with both datasets is lower than 10 p.p. at the end of the period (2016) in all the cases except in the two Italian regions, where the differences amount to 36 and 33 p.p. for Calabria and Emilia-

Romagna, respectively. This can be related to the different values observed for both accumulated allocations and accumulated expenditures in both databases.

Figure 2.17 Absorption rates (ERDF) 2007-2013. Case study regions. PERCEIVE dataset

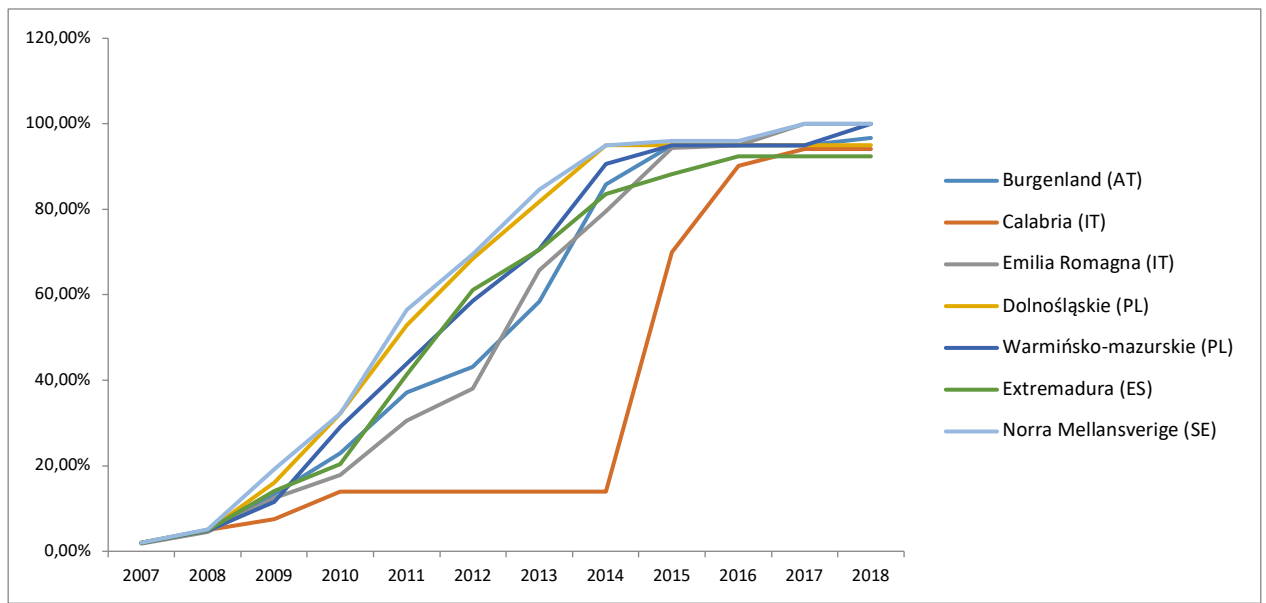
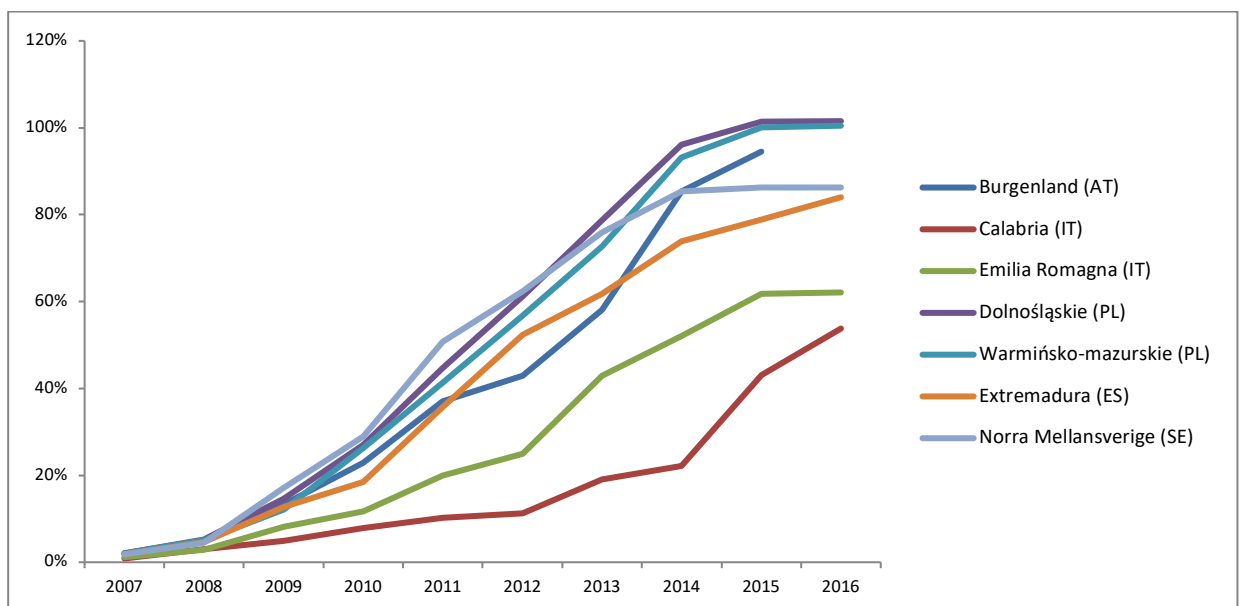


Figure 2.18 Absorption rates (ERDF) 2007-2013. Case study regions. Public dataset



2.5.2. Analysis of the effectiveness in the implementation of the CP in the case study regions.

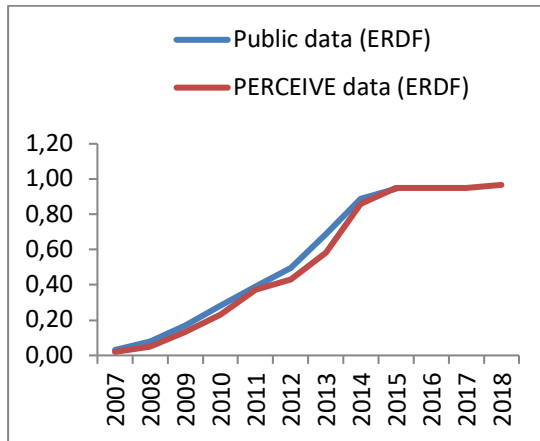
Focusing on the 9 case study regions, we turn now to analyse their effectiveness in the implementation of the CP in light of the results previously obtained for them, especially in Deliverable 1.1. We take into account not only the publicly available information but also the PERCEIVE dataset (in the case of the 7 regions for which we have it). The evolution of the absorption rates in all the regions is shown in Figure 2.19.

In the case of the Austrian region, **Burgenland**, we observe that the absorption rates with the PERCEIVE data and with public data are very similar. The rates computed with the PERCEIVE data are always lower, although with a difference always smaller than 5 p.p. (except in 2013 where it amounts to 10 points). It is interesting to comment that there is no difference between the absorption rate we computed in sub-section 2.4.2 with data for the ERDF+CF and when the ERDF is considered alone since in this region during this programming period, there is no funding under the CF.

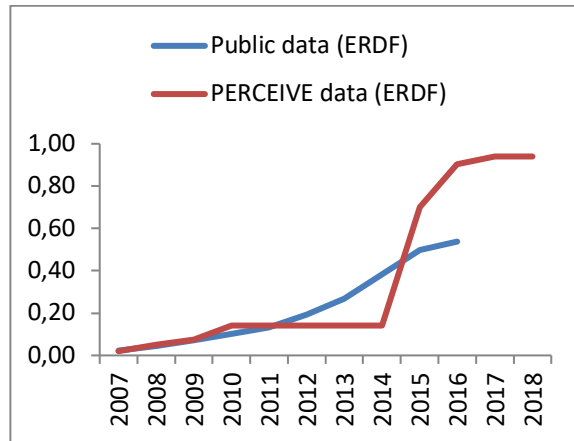
According to the PERCEIVE dataset, in the first 3 years of implementation of the programme, only 13% of the allocations were effectively paid, whereas it amounted till 58% in 2013. In 2018 the absorption rate was 97%, getting a situation of almost full absorption. As commented in Barberio et al (2017), according to the implementation report of the managing authority for the year 2014, the absorption rates at this year are slightly above 90% for most of the objectives, a very similar value to the one shown here. According to the document, the small size of the region can be seen as strength for Burgenland because of the possibility of involved actors to directly know each other leading to a speeding up of the process of negotiation. In this sense, due to the federal form of the Austrian political system, much of the decisional power is in fact concentrated in the provincial government especially as to what concerns the programming stage. The administrators, but also representatives of other roles in the policy system that were interviewed in the focus group reported in such document that "all maintained confidence in and even a certain pride of the outcome of Regional Policy implementation in their region. Some have pointed out that the compliance with EU requirements in terms of formal procedures – i.e. screening of projects – and reporting might create complexities when contrasted with the Austrian federal system – which also requires more local adjustments and coordination. Some mistakes have been admitted too – i.e. miscalculations in the expected outcome of certain investments – but generally it can be said that required key competences have always been found within the given institutional structures and organisations" (p. 45).

Figure 2.19 Absorption rates in case study regions

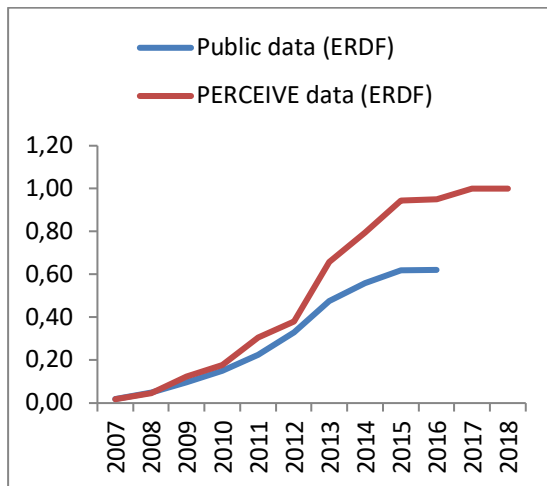
a. Burgerland (AT11)



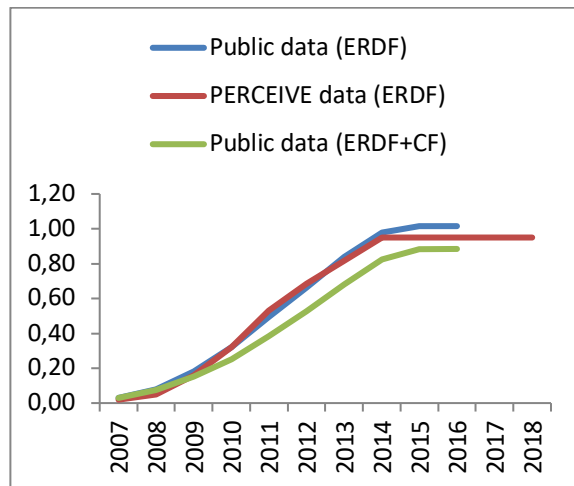
b. Calabria (ITF6)



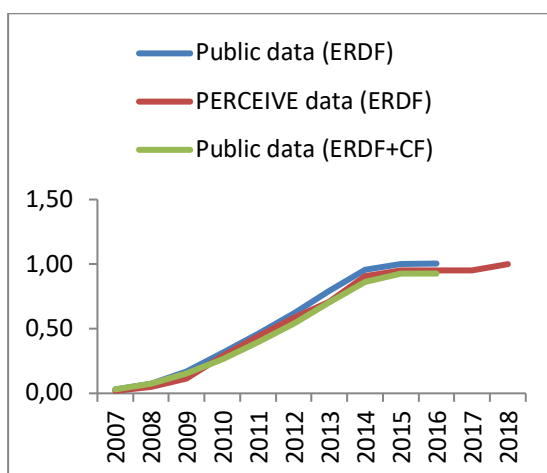
c. Emilia Romagna (ITH5)



d. Dolnośląskie (PL51)



e. Warmińsko-Mazurskie (PL62)



f. Sud-Est (RO22)

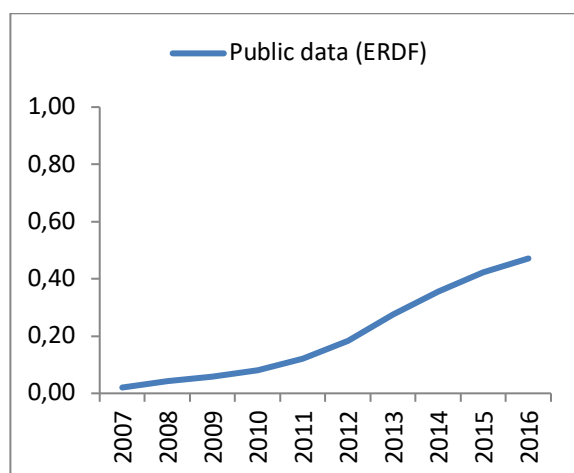
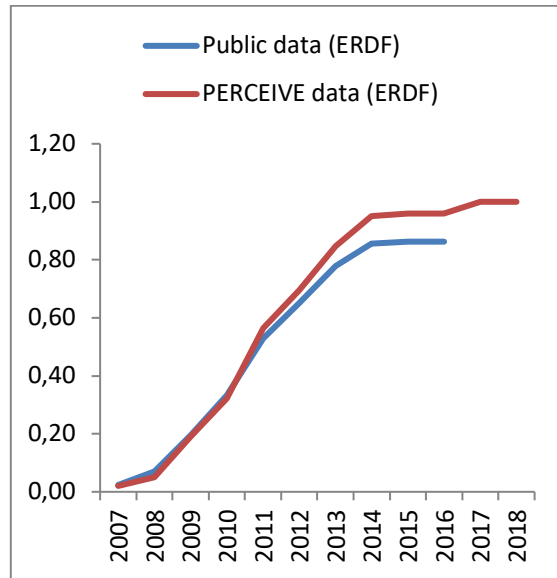
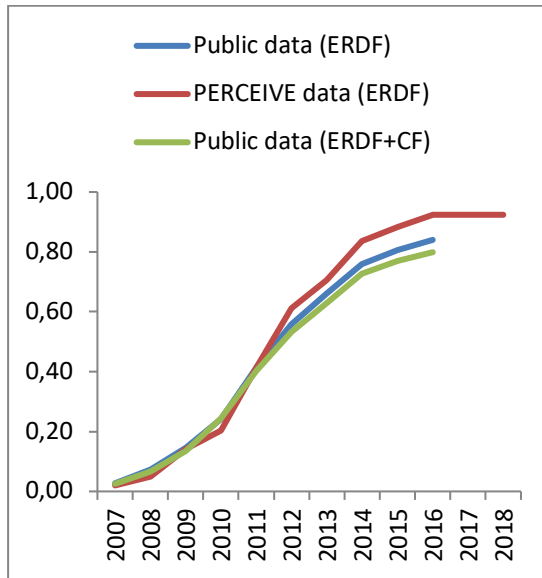
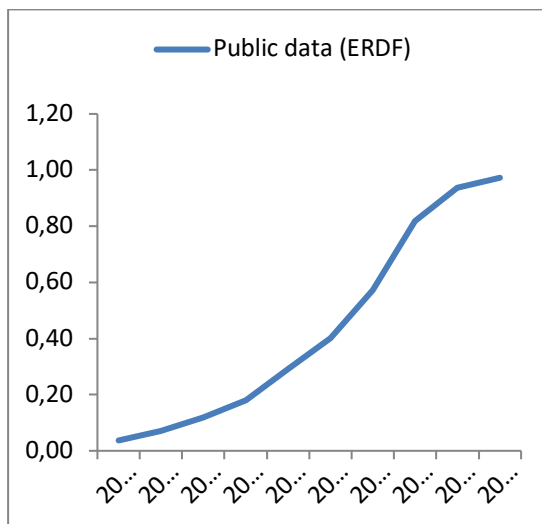


Figure 2.19 (cont.) Absorption rates in case study regions
g. Extremadura (ES43) h. Norra Mellansverige (SE31)



i. Essex (UKH3)



In the case of **Calabria**, with the information publicly available, the absorption rate is very small (54% in 2016), 36 p.p. lower than when more accurate information is considered as in the PERCEIVE project (90%). The differences observed are not relevant until 2013 (less than 5 p.p. of difference), but then it starts increasing considerably. In addition, it is worth highlighting that the differences in the accumulated values for expenditure and allocations are very different in both databases (being higher in the public dataset).

With the PERCEIVE dataset, in the first 3 years Calabria only managed to absorb 8% of the allocated funds, with a stagnation around 14% until 2014. At the end of the

period, the region had amounted 90% of the allocated funds. The analysis made in Aiello et al (2017) shows a pattern of the absorption in the implementation of the CP which is similar although with some differences to the one obtained here. The document highlights a certain difficulty and a slackening in the trend related to the ERDF and ESF projects and the expenditure performance in the first years of implementation: in fact, at the end of 2010 the absorption rate did not even reach 10% for both programmes. As of 2012 the absorption rate started to grow in a constant manner. Moreover, according to their data, the absorption rate of the ERDF results always lower than the ESF programme. In part, the improved expenditure performance for the regional programmes is due to the decrease of the initial fund allocation following the Region's adhesion to the Cohesion Action Agreement (PAC – *Patto di Azione e Coesione*) aimed at a greater commitment in planning and spending the funds. This led to a reduction of the allocation of the ERDF from the initial 3 billion Euros to about 2 billion Euros, and of the ESF from the initial €860 million to €573 million at the end of 2016. Only at the end of 2015 the absorption rate was above 80% for the ESF and 70% for the ERDF, and at the end of 2016 only the ESF reached 100%.

According to the authors of the document, Calabria region wrote an ERDF operational programme defined which was so visionary and ambitious that it managed to implement it only in part. Not only the 2007-2013 programme did not fill the chronic and historic gaps present in the region, but the economic crisis, worsening the problems affecting the regional context, caused the layout of the community programme to fall through. This is why most of the expenditure for the 2007-2013 programme was concentrated in the last years. Moreover, several difficulties within the public administration and others connected to Calabria's political and social context contributed in a relevant manner as well to the underuse of the community resources and, in general, to a non-effectiveness of the expenditure for the CP. "Among other problems highlighted in the focus group, Calabria lacks a cultural approach toward the economic programme. Moreover, it was difficult to come into line with the procedures of the European programme that envisage relevant phases, such as evaluation and monitoring, which the region mainly considered a mere bureaucratic fulfilment in the 2007-2013 programme. Furthermore, the organisation of the operational programme was not characterised neither by an in-depth analysis of the context based on factual data nor by the identification of the territory's needs with a consequent programming of actions and interventions. Probably the absence of a regional statistical office supporting the programme influenced this aspect in a relevant manner. In part these criticalities are ascribable to the level of institutional quality perceived which, despite an improvement in the last years, resulted to be among the lowest in Europe both in 2010 and in 2013" (p.37).

For the other Italian region, **Emilia Romagna**, the differences in the absorption rates obtained with the publicly available information and the PERCEIVE one is low until 2010 (less than 3 p.p. of difference) whereas it starts to increase in 2011, summing up 33 p.p. at the end of the period, probably due to the high values of accumulated allocations in 2014 in the case of the public dataset (if compared with the ones in the PERCEIVE project).

Using the PERCEIVE information, Emilia Romagna managed to spend 12% of the allocated funds in the first 3 years, summing up 31% in the fifth year and arriving to 2018 with full absorption. According to the analysis made in Aiello et al (2017), the absorption rate grew steadily throughout the period for both ERDF and ESF without any particular interruptions. As a result of the earthquake, there was an increase in the overall allocation to cope with the reconstruction. "The absorption rate, at least in the first 5 years, was higher for the ESF, due to the fact that in this operational programme projects are smaller on average and involve measures of a shorter duration. However, in 2013, both have an absorption rate of around 60% and reach 100% in the first half of 2016" (*Ibid*, p.25). The trend described in the document is, therefore, almost equal to the one offered in our descriptive figure.

The Polish region **Dolnośląskie** has both ERDF and CF. When the absorption rate is computed for the former we observe that such rate is very low in the first 3 years, so that the difference in the rate with both datasets is very small, increasing afterwards although being always lower than 7 p.p. It is interesting to note that after 5 years of the beginning of the programme, the Polish region managed to implement 53% of the allocated funds, while at the end of the period it gets almost full absorption (with the public data the absorption rate is slightly higher than 100%, probably due to the fact that the expenditures are updated until 2016 whereas the allocations are only until 2014). In any case, looking at the data for accumulated expenditures and commitments in both databases, the differences in those absolute values are substantial, a fact that gets reduced if the absorption rates are computed. Interestingly, if the percentage of absorption of the ERDF with the publicly data is 102% at the end of the period, it amounts to 88% when the ERDF and the CF are considered jointly.

Chmieleński et al (2017) signals institutional issues as the key factor that may influence the implementation of CP – the capacity of regional institutions to deal with the process of implementing regional development factors. According to it, "the political influence is exerted at an earlier stage when funds are divided among regions and national framework for implementation is developed" (*Ibid*, p.45).

In the case of the second region under analysis in Poland, **Warmińsko-Mazurskie**, the degree of absorption of the allocated funds is 100% in 2016. The rate of

implementation of the funds starts being low in the first 3 years, needing 6 years to be higher than 50% of the allocated funds. However, in 2014 it already amounts to more than 90%, getting the full absorption in 2016. As for the differences between the absorption rates in both datasets, they are very little, less than 5 p.p. and with very little differences in the accumulated magnitudes of expenditures and allocations.

As commented in the case of the previous Polish region (Chmieleński et al, 2017), the key factor that may influence the implementation of CP are related to institutional issues – the capacity of regional institutions to deal with the process of implementing regional development factors.

In the case of the Romanian region, **Sud-Est**, the start of the implementation of the 2007-13 was rather slow, with only 12% of the allocated funds being executed in 2011. According to Tudor et al (2017), this slow starting could be due to both institutional issues, related to the set-up of the management network, and technical ones, related to the elaboration of the calls for projects. In 2016, the absorption rate amounted to 47%, far from full absorption. "The funds allocated to Romania through the CP are managed at national level, the regional allocations within it being a guideline, susceptible to be modified along the implementation process, based on absorption's evolution (following the programmes' evaluation by the Management Authorities and financial allocations' modification approval by the European Commission)" (*Ibíd*, p.19).

The **Essex** region finished the OP with almost full absorption, 97% of the fund allocations paid in 2016. Although with a slow starting, only 12% of the payments made in the first 3 years, the maximum increase is obtained in 2014, when the rate passes from 57% to 82%. As commented in Collins et al (2017), the Essex area showed a relatively lower performance if compared to the whole of the UK. Indeed, of the €36.92 million of ERDF funds allocated in the 2007-13 programming period, only around 59% were actually spent in 2013. "To this regard, it is worth noticing that two of the UK's five districts with the highest percentage of people which backed Brexit were in Essex (i.e. Castle Point, 72.7% and Thurrock, 72.3%). Furthermore, every district in Essex voted to leave the EU. This seems to confirm that, for example, the €22,09 million of EU funds spent in the area in the 2007-2013 programming period were not effective in shaping a positive perception of the EU. At the institutional level, it is worth noticing also the quite low absorption rate in the aforementioned Thurrock area spending only €7,36 million of the 12,31 allocated as an evidence of the relevance of the role of institutions in shaping citizens' perception about the EU" (*Ibíd*, p.32).

For the case of **Extremadura**, the absorption rates obtained with the PERCEIVE data compared to the one obtained with the public data are very similar at the beginning of the period (only one or two p.p. of difference), whereas from 2011, the difference starts to increase (with a maximum difference of 8 p.p.) with the rates computed with the PERCEIVE data being always higher. It is interesting to highlight that the absorption rate we computed in sub-section 2.4.2 with data for the ERDF+CF amounts to 80% whereas it is 84% when the ERDF is considered alone. This pattern is observed in all the cases in which there are CF. As a consequence, we can conclude that the funds in the CF are worse absorbed than the funds in the ERDF, which has to do with the fact that the CF are designed for infrastructure investments, usually large projects with a long planning and implementation periods, so that payments may be substantially lower than commitments.

As signaled in López-Bazo et al (2017), the European Commission approved the Operational Program of Extremadura 2007-2013 in November 2007 and by the end of 2014, about 80% of the programmed funds had been already executed (a value close to the ones obtained through the publicly available data used in this section), and the Managing Authority was taking appropriate measures to accelerate the implementation of operational programs and to ensure the full absorption of SF. Two main reasons are mentioned in the aforementioned document as obstructing factors for the full absorption of funds:

- i) The original design of the OP, with an extreme concentration of funds in the convergence regions.
- ii) The effects of the crisis, both in the public and private sectors, which limits the financial capacity and the demand for this type of projects. The OP was majorly managed by public bodies and only in some areas private investment was playing a role. Major investments were made on transportation networks, water filtering systems and social infrastructures, including education and health facilities. Conversely, projects focused in investments in R&D and innovation could not follow the OP in the same line. This was partially due to the firm size and sectoral distribution of economic activity in the region, and to some extent also as a result of the crisis episode that stopped firms to invest in improving quality standards and competitiveness and drove them to a survival episode.

The OP was seen by beneficiaries from public bodies as flexible, as far as it allowed changing priorities and letting specific changes between alternative priority themes. Nevertheless, local managers did not have the same perspective. The management of SF was very badly perceived by local managers since despite the substantive decentralization of the political system in Spain, the CP is organized in

a way that any delay in European or Spanish frameworks severely affected regional managers.

Norra Mellansverige, the Swedish region under analysis, presents absorption rates that at the end of the period amount to 86% with the public information and 96% with the PERCEIVE information (100% in 2017). This is in fact the highest difference in the whole period, whereas the difference is very small until 2012 (less than 4 p.p). The region needed 5 years to absorb 50% of the funds (end of 2011), getting full absorption in 2017, but not in 2016 (which is about 86% or 96% depending on the database used).

In Charron (2017), it is said that "when looking at past budget years, the region has consistently met its goals (and at times surpassed them) and has a high absorption rate of Funds, above 96% in all cases" (*Ibíd*, p.30). This is the same as obtained here. According to the focus group, "when projects go over regional borders in Sweden, then there is some contact between employees of Norra Mellansverige and other regional, NUTS-2 offices in the country. Yet there are no consistent annual conferences or workshops for the practitioners to meet country wide" (*Ibíd*, p.30).

In a final step, we analyse whether there is any kind of significant relationship between the effectiveness of the use of the CP and the identification with the EU. Table 2.4 offers the coefficients of correlation between the main proxies for the effectiveness in the use of the CP (allocations, payments, absorption rates and the speed in the implementation of the funds) and some of the variables gathered in the PERCEIVE survey (Task 2.1) to proxy for the identification of the citizens with the EU: Share of individuals that think that the EU membership is a good thing; Level of identification with Europe; Support to the CP; and Share of individuals that heard about the SF. This is done with the data for the 9 regions under analysis, which are the ones with enough number of respondents in the survey as to assure regional representativeness. According to the coefficients of correlation in the table, we observe that those regions with higher payments to the ERDF and CF tend to have citizens with higher levels of identification with Europe and a higher support to CP. Similarly, the regions with higher absorption rates are significantly correlated with a higher share of individuals thinking EU membership is good and with a higher identification with Europe. This is not the case with allocations, where we do not observe any significant value of the coefficients of correlation.

Table 2.4 Correlation between CP effectiveness and identification with EU

	Individuals thinking EU membership is good	Level of identification with Europe	Individuals supporting CP	Individuals that heard about SF
Absorption rates	0.68**	0.68**	0.45	-0.03
Payments pc	0.60*	0.67**	0.69**	0.79**
Allocations pc	0.39	0.44	0.54	0.74**
Share in 3 years	0.17	0.31	0.12	-0.11
Share in 5 years	0.14	0.34	0.19	-0.13
Share in last 3 years	-0.24	-0.41	-0.19	0.01
Years until 50%	-0.17	-0.31	-0.24	-0.04

Note: Coefficients of pairwise correlation obtained with the sample of the 9 case study regions. *, ** and *** indicate significance at 10%, 5% and 1%, respectively. The variables *Individuals thinking EU membership is good*, *Individuals supporting CP* and *Individuals that heard about SF* are shares out of the population. The variable *Level of identification with Europe* imply responses in a 0-10 scale, with 0 being *I don't identify at all*, and 10 being *I identify very strongly*.

2.6. Limits represented by lack of comparable data on the CP implementation effectiveness in the European regions.

Up to this point of the deliverable, we have encountered problems in the computation of the variables that try to proxy for the effectiveness in the implementation of the CP at the **regional level**. As previously signalled, the problem arises because it is not straightforward to consistently allocate the European SF to the EU NUTS2 regions which depends on the available data sources and the quality of these data. In this section, we plan to highlight the limits represented by such problems and how they may affect the quality of structured quantitative analyses as the ones made in the remaining parts of this deliverable.

The main limitations can be summarized as follows:

- **Lack of timely available data on EU funds payments.** Although the OP finished in 2013, the MS could make expenditures until March 2016. Therefore, it is impossible to analyse the effectiveness of the OP 2007-2013 at the regional level until the end of 2016 (3 years after the closure of the program).
- **Changes in the data of allocations along time.** In the cases in which the programme has just finished, and not all payments have been made,

"commitment data may safely be used as a proxy for payments also concerning regional variations" (SWECO 2008). In any case, it is necessary to highlight that the data on allocations also change along time: in most of the cases, the amount of allocations for the OP 2007-2013 given in 2014 is higher than the allocations given in 2013; but for some categories of expenditure and for some regions, it can be the opposite, that is, the value in 2014 is lower than in 2013. The most plausible explanation for this fact seems to be that the allocations have been re-directed to different regions than initially planned. As a consequence, the analysis of effectiveness of the OP cannot be done with reliability when the programme has just finished not only because of lack of payments but also because of changes in the allocations for each region.

- **Lack of comparable data on EU funds payments and allocations.** Due to the lack of a harmonized NUTS2 classification between allocations in 2014 and payments updated until 2016 (shifts not just in codes of the regions but also in boundaries), it is not possible to make a perfect match of both magnitudes to obtain the absorption rates as well as the speed in the implementation of the funds.
- **Accounting systems that do not reflect exactly what is really done on ground.** Due to the features of the accounting systems, there are cases of priorities and/or NUTS codes, in specific OPs, characterised by expenditures larger than allocations, because the cumulative data up to a certain year may show a positive expenditure but no commitment because the entire (revised) allocation to a selected project(s) may be shifted to another following year when a new operation is approved. It can also be the case that some countries carry out transfers of expenditure between regions that are not reflected in the allocated amounts.
- **Absorption rates very different at the end of the programming period and when the program is actually closed and all payments made.** Comparing absorption rates in 2014 and 2016, the changes are very important. Thus, the computation of such indicator in 2014 does not seem to be very reliable.
- **Little reliability for the yearly data on payments.** The data on payments at the regional level at the end of the programming period 2007-2013 are more reliable than the yearly data, which were estimated using strong assumptions, making them less reliable. In any case, when the yearly data are needed (e.g. for the computation of the measures proxying for the speed in the implementation of the funds), we can use two measures for payments: i) the regionalized data provided by the MAs or through the application of certain

apportioning rules to the payments in order to estimate the share of payment by each NUTS2 region; ii) an estimation of the annual profile or real expenditure through a modelling procedure. According to the Commission itself,¹² the first option “follows the cycle of the European Commission payments to MS and not the date on which real expenditures took place on the ground”, which could affect negatively any analysis based on them. Indeed, comparing the payments done by year in the case of modelled and non-modelled data, we observe that the modelled ones tend to present a lower speed in the absorption of the funds.

- **Different reliability of the data for the different SF.** The reliability of the data payments for the ERDF and CF at the NUTS2 level is much higher than in the case of the ESF, which cannot be easily regionalized. In addition, the information for the allocations is only given for ERDF and CF. These two reasons prevent us from computing the absorption rates for the ESF. With respect to the absorption rates for ERDF and CF, we have observed that the degree of absorption in the case of CF programmes tends to be lower given that the latter are designed for infrastructure investments, which tend to be large projects with a long planning and implementation periods, so that payments may be substantially lower than commitments.
- **Difficulty in comparing data between programming periods.** Despite not being a main purpose of this first chapter of the deliverable, the data on expenditure for the 2000-2006 and 2007-2013 programmes are not fully comparable because of lack of correspondence of NUTS2 classifications and because of being created with different methods and from different sources. The 2007-2013 data on expenditures were collected from management authorities, which is different from before since in 2000-2006, expenditure was estimated on the basis of payments approved by DG Budget (European Commission, 2015a). As a consequence, although the absorption rates can be computed for both programmes, they are many issues that constrain consolidation between them.
- **No disaggregation of expenditure categories possible in the analysis of absorption rates.** We cannot compute the absorption rates for different areas of expenditure given that the information on the most updated expenditure is not disaggregated for different areas (contrary to the information on allocations which is disaggregated). Therefore, if one wants to analyse the structure of the absorption rates for different priorities, it is

¹² <https://cohesiondata.ec.europa.eu/Other/Historic-EU-payments-regionalised-and-modelled/tc55-7ysv>

needed to do it with the information of expenditures available until 2014, which is not the most updated and reliable dataset (this is done in Gorzelak et al, 2016).

3. Territorial disparities in identification of citizens with the EU project.

3.1. Introduction.

This chapter describes disparities between EU countries and regions in aggregate indicators that proxy the citizens' support for the EU project and their attitudes towards the Union. It does so from a dynamic perspective by analysing the evolution of territorial disparities since the beginning of the 21st century. The results are obtained and discussed for the entire set of EU member states as well as for the EU 15 on the one hand, and the EU 13 on the other. This allows us to analyse and assess differences in support and attitudes towards the EU project between the newest and oldest members of the EU.

As to the analysis of regional disparities, the indicators are computed for a set of subnational territories that combines NUTS 1 and NUTS 2 regions. In a first step, the level of spatial disaggregation that is available in the Eurobarometer datasets for each country was used. Then, the definition of the spatial units was modified in some cases to maximize the matching with data available for the other regional indicators used in the following chapters. In fact, the results provided in this section are important in themselves but are also crucial to frame the analyses carried out in the rest of the deliverable. To be clear, the assessment of the degree of support and citizens' attitudes towards the EU, and how they have evolved in the last years, will facilitate the interpretation of the evidence provided in Chapter 4 regarding the influence of the Cohesion Policy and some socio-economic factors. Similarly, it will help to understand the effect of the growth experienced by the EU regional economies, and their convergence/divergence patterns during the period under analysis, on support and attitudes (Chapter 5).

As mentioned above, the Eurobarometer surveys are the source of data for the analyses carried out in this chapter. Although the specific details are provided in the next section, it is worth noting here that the micro-data files of the Eurobarometer surveys contain information for samples of individuals that aim to be representative of the population of the EU and each member state. However, the number of individuals included in the sample from each region is not, in general, large enough to claim that they represent, at least to some extent, the regional populations. In order to overcome this limitation, we have adopted the solution proposed in Dąbrowski et al (2017) and Capello and Perucca (2018), which consists in pooling Eurobarometer surveys of several consecutive years. This allows us to compute aggregate indicators of the magnitudes of interest for a wide group of EU regions, that are expected to be appropriate estimations of the perceptions of their populations.

3.2. Dataset and indicators.

The previous deliverables of Work Package 2 used the PERCEIVE Survey (Charron and Bauhr, 2017; Deliverable 1.2) as the main source of information for the citizens' perception of the Cohesion Policy and their identification with the European Project. This was convenient because the analyses carried out in these previous deliverables did not take the time dimension into consideration. Their objectives were achieved by exploiting the static picture provided by the PERCEIVE Survey for 2017. By contrast, the essential aspects of this deliverable are: i) the analysis of the evolution over time of the citizens' perceptions of the EU (their support to and attitudes towards the Union), and ii) the study of the impact of the Cohesion Policy, of the growth that it induced on the EU regions, and the effects of some socio-economic features of the regions. Therefore, we explore other data sources that allowed us to compute feasible measures of identification and support for the European countries and regions over a long enough period of time.

The most popular data source for similar analyses in the literature is the Eurobarometer survey. The Eurobarometer is conducted since the mid 70's on behalf of the European Commission to monitor the public opinion in the EU and its member states, in particular with respect to the perception that citizens have about the EU integration process, its institutions and policies. The Standard Eurobarometer¹³ includes a series of 'stable' or 'topical' questions that allow tracking the evolution of the public opinion on specific issues. In particular, a group of questions asks for attitudes towards European integration and perception of the EU institutions.

Data from the Standard Eurobarometer survey is collected twice a year, in spring and autumn, by means of face-to-face interviews to approximately 1,000 individuals, aged 15 years and over, in each country.¹⁴ The samples for the Standard Eurobarometer surveys are new and independently drawn (repeated cross-sections). The sampling procedure takes into account the distribution of the population of each country in terms of metropolitan, urban and rural areas, within the administrative regions (NUTS 2 in almost all countries) of each country.

The statistical margins due to the sampling process are shown to be within acceptable limits for the size of the country samples, i.e. for about 1,000

¹³ In addition to the Standard Eurobarometer, special topics are explored in the Flash Eurobarometer surveys. More details can be accessed at <http://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/General/index> and <https://www.gesis.org/eurobarometer-data-service/home/>

¹⁴ About 500 interviews in small countries.

responses. Therefore, conclusions derived from responses in the Standard Eurobarometer surveys for the EU as a whole and for every member state are expected to be reliable. However, deviations from the real figures in the population increase as the number of observations shrinks. This is important for this study, as we intend to compute indicators of support and attitudes for the set of EU regions, while the number of sample observations for each one is rather limited. As in Dąbrowski et al (2017) and Capello and Perucca (2018), we try to overcome this drawback by combining the samples of the Eurobarometer surveys of three consecutive years. In this way, the number of responses by region is expected to be large enough to keep the statistical margins within reasonable limits.¹⁵ In any case, it should be mentioned that some robustness checks were performed to assess the influence of the inclusion of the regions with the lowest number of responses. In general, the main conclusions derived from the results reported using the entire set of regions are not affected by the exclusion of those with the lowest number of responses.

The period under analysis in this Chapter and the followings ranges from 2000 to 2016. Although it is possible to compute indicators of support and attitudes using the Eurobarometer surveys prior to 2000, we have not made use of this earlier information for several reasons. First, because of the interest in this deliverable on the effect of Cohesion Policy, the growth of the regional economies, and other socio-economic characteristics. Homogeneous 'official' data for most of these magnitudes is only available in the PERCEIVE regional database since 2000 (see Deliverable 2.1). Second, because the information for the questions of interest in the Standard Eurobarometer surveys is available only for the EU member states in the year in which the survey was carried out. To be clear, information for the EU 13 countries was only included starting from the year in which they joined the EU.¹⁶ Finally, because changes over time in the definition of the territorial breakdown (NUTS system) makes the comparison of the regional aggregate figures from the Eurobarometer survey over long periods of time rather difficult. Similarly, the Eurobarometer surveys for 2017 and 2018 have not been used in this study because they were not available when the above-mentioned databases were prepared and also because of the lack of data for the regional socio-economic magnitudes for these years.

¹⁵ The average number of observations used to compute the indicators in the set of regions used for the analysis is 442.7, whereas in the median region there are 297 observations. In less than 10% of the regions, the number of responses is lower than 100, whereas in the top 25% there are more than 500 responses.

¹⁶ The consideration of information from the CEE Eurobarometer (1990-1997) and the Candidate Countries Eurobarometer (2000-2004) could be an interesting exercise but is beyond the scope of this deliverable.

Considering these circumstances, the analysis of the evolution of the territorial disparities in this section defines three subperiods, including three years each: 2000–2002, 2007–2009, and 2014–2016. The first is a period of growth of the European economy, while the second includes the downturn caused by the financial and economic crises. The last subperiod corresponds to the initial phase of the recovery, characterized by moderate growth. It is assumed that the degree of support and attitudes towards the EU in a country or region does not change dramatically from one year to the next. For that reason, the analysis allows for a window of five years between subperiods, in order to maximize the possibility of differences in the citizens' perceptions in the territories under analysis.

It should be mentioned that this deliverable uses the regional codes made available by UGoT both in the PERCEIVE regional dataset (Deliverable 2.1) and in the micro-data files of the Standard Eurobarometers from 2000 to 2016.¹⁷ This facilitates the construction of the measures of support and attitudes from the Eurobarometer micro-data files for a set of EU regions in different years, and the combination of the resulting indicators with the other regional magnitudes used in the analyses carried out in the following Chapters.¹⁸ In any case, it should be mentioned that we had to deal with changes in the definition of the NUTS system introduced over the analysed period, which in some cases resulted in a decrease in the territorial detail used for some countries (e.g. by grouping some regions). In addition, we gathered responses in regions with a low number of individuals in the sample even after adding the responses in the Eurobarometer surveys of three consecutive years. The criteria for grouping regions in this case was geographical proximity. As a result, the final set of territorial units is composed by 180 regions, 124 from the EU 15 and 56 from the EU 13 (see Table A3.1 of Annex 3).¹⁹

The Eurobarometer surveys used to compute the indicators of interest for the sets of EU countries and regions in the three periods were selected based on the inclusion of the questions proxying for support and attitudes (since not all questions are included in both the spring and autumn editions). They are the following ones:

¹⁷ Available at <https://zenodo.org/record/845349#.XAViPC2ZPUI>

¹⁸ For those editions of the Eurobarometer survey that were not included in the databases prepared by the UGoT team, regional codes have been assigned using the same criteria applied for those included.

¹⁹ The number of regions by country is as follows: AT (9), BE (11), BG (6), CY (1), CZ (8), DE (16), DK (4), EE (1), ES (15), FI (4), FR (17), GB (12), GR (3), HR (2), HU (7), IE (2), IT (12), LT (1), LU (1), LV (1), MT (1), NL (10), PL (14), PT (5), RO (8), SE (3), SI (2), SK (4).

- Period 2000–2002: ZA3296–Eurobarometer 53 (spring 2000), ZA3627–Eurobarometer 56.2 (autumn 2001), ZA3693–Eurobarometer 58.1 (autumn 2002)
- Period 2007–2009: ZA4530–Eurobarometer 67.2 (spring 2007), ZA4819–Eurobarometer 70.1 (autumn 2008), ZA4994–Eurobarometer 72.4 (autumn 2009)
- Period 2014–2016: ZA5932–Eurobarometer 82.3 (autumn 2014), ZA5998–Eurobarometer 83.3 (spring 2015), ZA6788–Eurobarometer 86.2 (autumn 2016)

From each of these Eurobarometer surveys, the individual responses to four specific questions are used to compute four aggregate indicators for the countries and regions of the EU.

The first two questions are used as proxies for the degree of support to the EU integration. One of them uses the responses to this question:

"Generally speaking, do you think that (OUR COUNTRY'S) membership of the European Union is ...?"

A good thing / A bad thing / Neither a good thing nor a bad thing / DK"

The degree of support to the EU based on this question is computed as the share of people in the country or region that responded 'A good thing'. This indicator of support for the EU in the countries and regions is the one most frequently used in the extant literature (e.g. Duch and Taylor, 1997, Serricchio et al, 2013; Verhaegen et al, 2014).

Similarly, and following some studies in the literature (e.g. Gabel and Palmer, 1995), a complementary indicator of support is computed as the share of people that responded 'Benefited' to the question:

"Taking everything into account, would you say that (OUR COUNTRY) has on balance benefited or not from being a member of the EU?"

Benefited / Not benefited / DK"

The other group of two indicators aims to proxy the citizens' attitudes towards the EU. They are based on the degree of the trust in the EU and the image that the EU evokes to citizens. For the former, the share of the population that tend to trust in the EU is computed using the response 'Tend to trust' to the following question:

"I would like to ask you a question about how much trust you have in certain institutions. For each of the following institutions, please tell me if you tend to trust it or tend not to trust it?"

- *The European Union"*

A similar indicator of trust in the EU has been used in, for instance, the studies of Harterveld et al (2013) and Hobolt and de Vries (2016).

Regarding the positive image of the EU, we use the responses to the question:

"In general, does the European Union conjure up for you a very positive, fairly positive, neutral, fairly negative or very negative image?"

It is assumed that individuals that responded 'Very positive' and 'Fairly positive' have a more positive attitude towards the EU than those for which the EU conjured up a neutral or even a negative image. This indicator of the EU image has been used in e.g. Dąbrowski et al (2017).

It should be noted that, in all cases, the corresponding weights available in the micro-data files of the Eurobarometer surveys has been used to estimate the shares in the population.

3.3. Differences between member states.

It is well known that there are sizeable disparities in several socio-economic dimensions between the countries that form the EU. It is standard practice to distinguish between economies in the core and in the periphery, or between northern, southern and central and eastern European countries, when describing the situation and evolution of magnitudes such as income per capita, productivity, unemployment, technology, and inequality. As a result, a clear distinction between member states is also observed in the allocation of Cohesion funds. Based on the economic utilitarian argument (Gabel, 1998; Garry and Tilley, 2009), it may be argued that such disparities in the socio-economic context can result in differences between countries in the degree of their citizens' support to the European project and in how they perceive the EU. Similarly, one would expect high persistence in the indicators of support and attitude for the EU countries when the relative situation of the economy of every country evolves smoothly over time, and therefore when there are only minor changes in the ranking of countries in terms of the essential macro-economic magnitudes. However, asymmetries in the incidence of the financial and sovereign debt crises, and the response of the EU institutions, may have provoked sudden, and perhaps persistent, changes in the perceptions of citizens in the different countries.

The figures for the indicators of support and attitudes described above are computed for the 28 EU countries for the periods 2007–2009 and 2014–2016. Due to the lack of information in the Eurobarometer surveys for 2000 to 2002 for the EU 13 countries, the figures are computed only for the countries of the EU 15 for this first period. The descriptive evidence for each indicator is summarized in Figures 3.1 to 3.4.

The percentage of the country's population that believed that the country's membership of the EU is a good thing is reported at the top of Figure 3.1. As already mentioned, a distinction is made between the EU 15 (left) and the EU 13 (right) not only because of the lack of data for the first subperiod (2000 to 2002) for the latter group of countries, but also because the pattern can be different for these countries due to the short period of time since their accession to the Union, that have been shown to correlate with the citizens' perception of the EU (Gabel, 1998).

In the case of the EU 15, the highest shares for this indicator of support for the EU are observed in three small countries: Luxembourg, The Netherlands, and Ireland. Contrariwise, the lowest shares are observed in Austria, Finland, France and, as expected, Great Britain. However, while support is quite stable in France and even decreased somewhat in Austria, an increasing trend is observed in Finland and Great Britain. The improvement in support for the EU is also observed in another Nordic country, Sweden, in which the increase in support is of almost 20 points between the beginning of the 2000s and the last subperiod under analysis. More striking is the evolution of support (as measure by the percentage of respondents that believed that EU membership is a good thing) in Great Britain, particularly given the rise of Euroscepticism over the last part of the period analysed and results in the Brexit referendum. In fact, the proportion of population that support the EU project in Great Britain as proxied by the indicator is slightly below the 50% in the last period under analysis, almost 20 percentage points more than in the 2000-2002 period.

There are other EU 15 countries that also experienced changes worth mentioning. In particular, the member states most affected by the crisis and the adjustment programs implemented by the European institutions. The decrease in support is quite important in Portugal and, particularly, Greece. In this latter country, support for the EU was almost halved between the first and the last subperiods. By contrast, the impact of the crisis and its management by the EU on support seems to have been much smaller in Spain and Ireland. Interestingly, an intense increase in support is observed over the same period in Germany, Finland, and Sweden, that can be linked to the role played by these countries, and the situation of their economies, during the turbulent times caused by the sovereign debt crisis.

As to the newest member states, it is observed that differences between countries in this measure of support are also far from negligible. On one side, about 60% of the population believed that their country's membership of the EU was a good thing in Estonia, Poland, and Romania. Lithuania and Malta joined that group in the last subperiod, whereas a similar share is observed for Slovakia at the end of the past decade, but not in the middle of the current one. On the opposite side we

find a group of countries with rather low figures for this indicator in the 2007–2009 subperiod (around 30%) that however increased substantially the share in the last one (Croatia, Hungary, Latvia). Conversely, support in Cyprus and the Czech Republic decreased from already low values at the end of the past decade. Overall, it can be concluded that, as in the case of the oldest member states, there are remarkable differences between the group of EU 13 countries both in the degree of support to the EU of their populations and in its evolution over the last decade.

Information about persistence in this indicator of support for the EU is provided in the graphs at the bottom of Figure 3.1. The dots in these graphs identify the values in two consecutive subperiods for the EU 15 (left) and the EU 28 (right) countries. The corresponding regression lines are also represented in the graphs. The three subperiods were used to produce the graph for the EU 15, whereas only the last two for the EU 28 (due to the lack of data for the first subperiod for the EU 13). However, the regressions for the last two subperiods were computed for the different groups of countries to allow comparison of the degree of persistence between them. The results are provided in Table A3.2 of Annex 3. In brief, the results from the set of EU countries confirm that there is significant persistence in support for the EU. Also, that this high stability in support is due to a much greater extent to the EU 15 countries than to the group of EU 13 (using the observations for the last two subperiods, the slope of the regression line for the EU 15 is 0.92 compared to 0.44 in the case of the EU 13).

Figure 3.2 depicts the results for an alternative indicator of support, the share of population that believed that their country benefited from being member of the EU. It is observed that, in general, the two indicators are closely linked, both in the group of the oldest and in the newest member states. Therefore, most of the comments made above as regards the amount of disparities between countries, and the changes over the period analysed, apply to this case. However, there is a feature that should be pinpointed. This is the higher proportions of population in the EU 13 group of countries that believed that belonging to the EU is beneficial for the country in comparison with the shares in these countries that believed that EU membership is a good thing. With only few exceptions (e.g. Bulgaria), the proportions represented in Figure 3.2 for the EU 13 countries are between 10 and 20 percentage points higher than those for the same group of countries in Figure 3.1. This is something that should be taken into account in the following sections as it could be due to the fact that individuals in these countries take more into consideration the economic benefits of being part of the EU when responding to the second question than to the first one.

Figure 3.1. Differences between countries in Support to the EU.

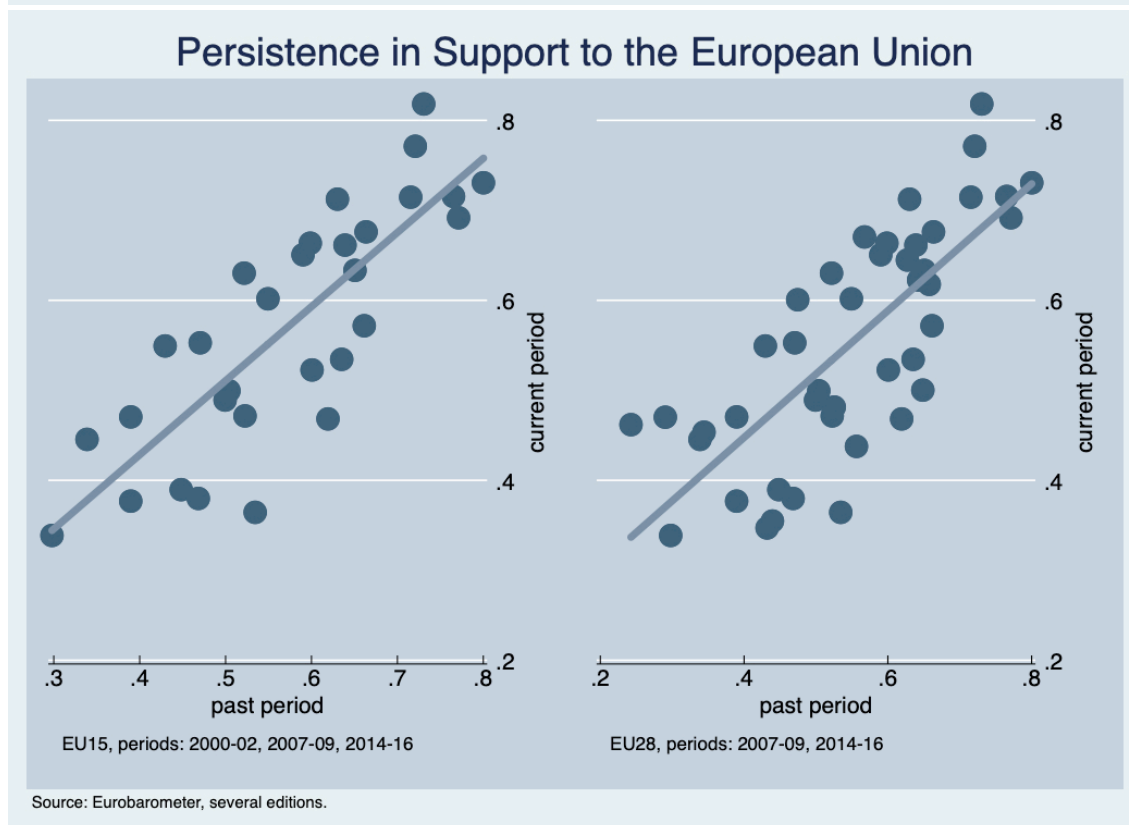
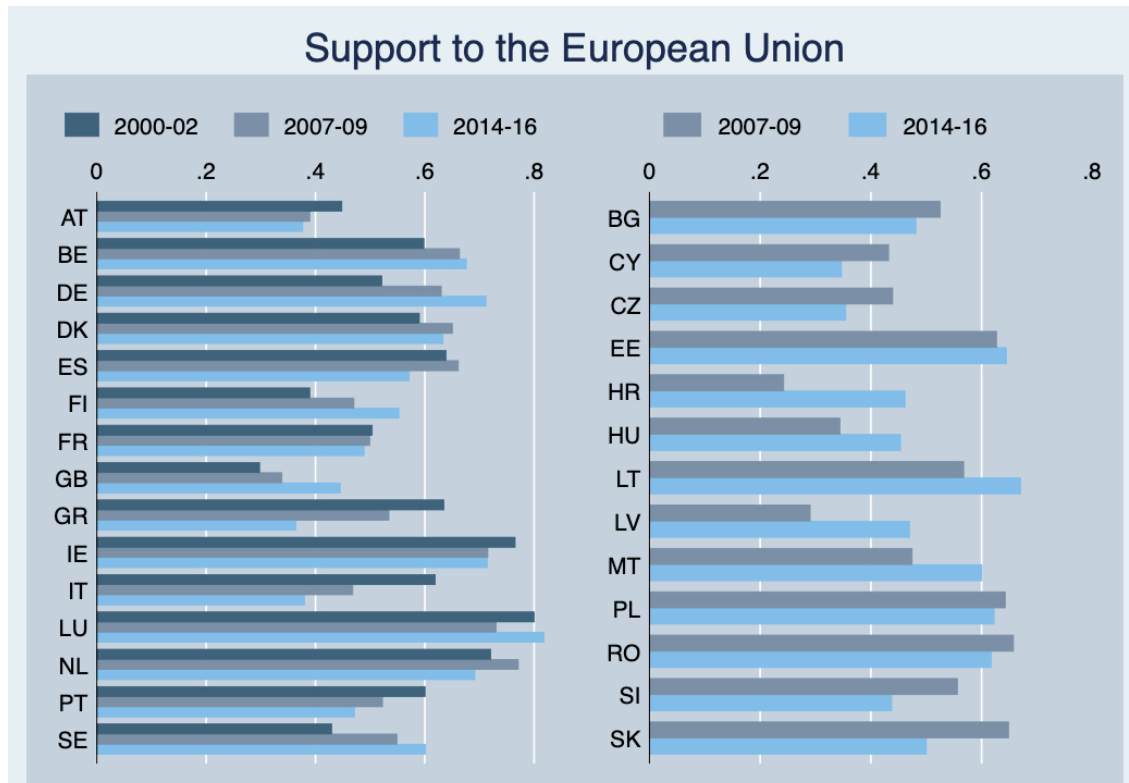
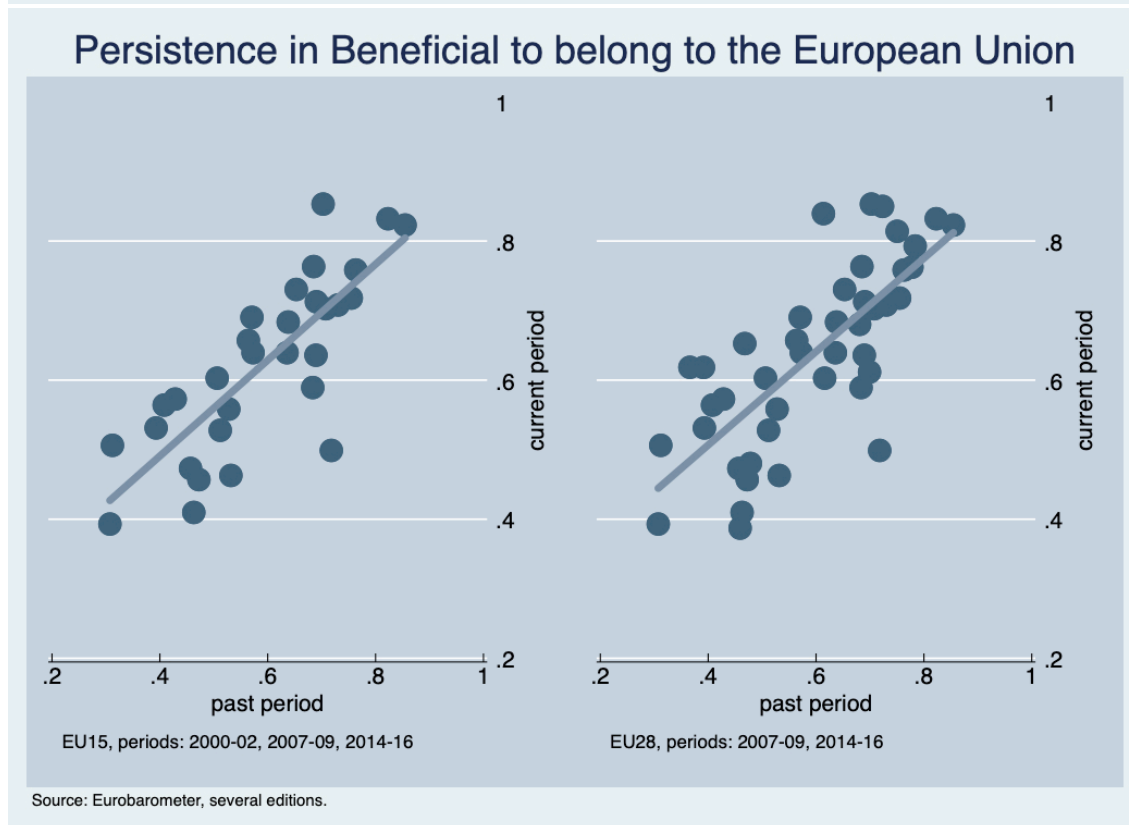
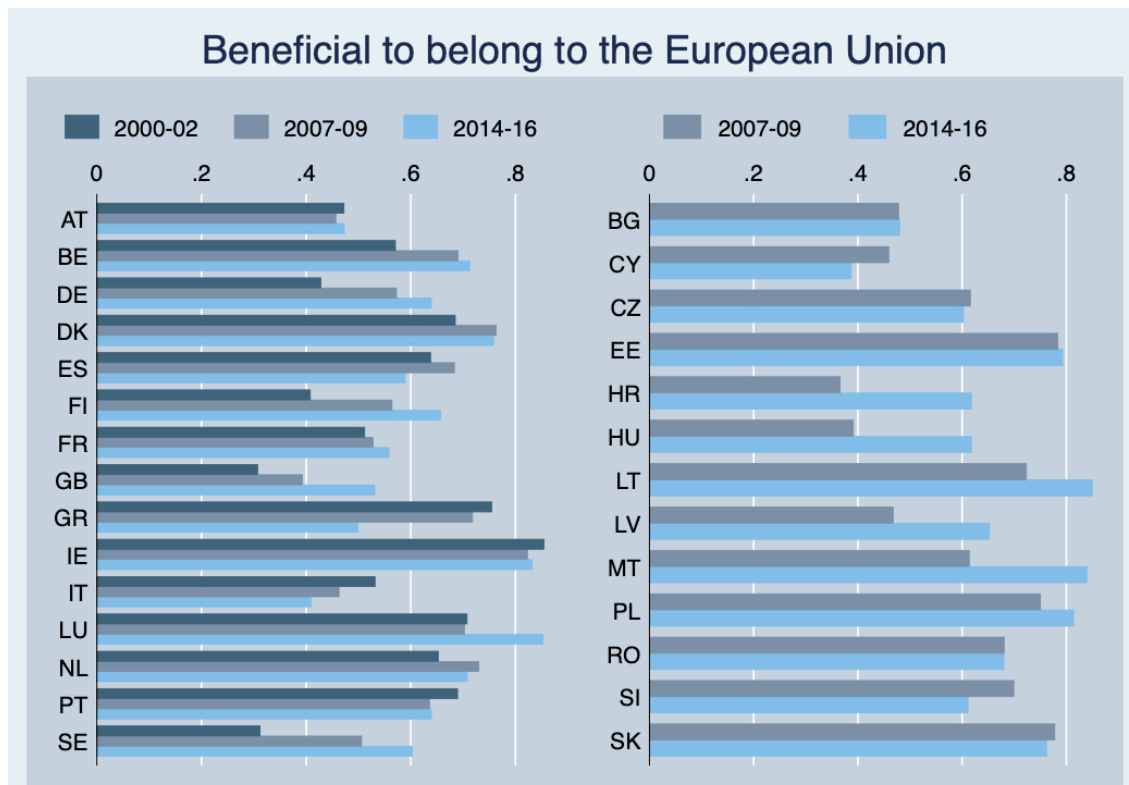


Figure 3.2. Differences between countries in Beneficial to belong to the EU.



Regarding the first indicator of the citizens' attitude towards the EU, the results of the proportion of population in each country that trust in the EU are reported in Figure 3.3. As in the case of indicators of support, sizeable differences between countries are observed. This is so when the 28 member states are compared and also when looking within the EU 15 and the EU 13 groups. But in our view, the most interesting results is the decrease in the degree of trust in most countries, which is quite intense in some of them. In the EU 15 group we find the countries in which the sovereign debt crisis was more intense (Spain, Greece, Ireland, Portugal) but also others of the EU 15 group, as Belgium, Germany, France, Luxembourg and The Netherlands. Interestingly, trust decreased in some core countries such as Germany, although support for the EU, as measured by the previous indicators, increased over the same period. Meanwhile, the reduction in the degree of trust among the EU 13 countries was particularly intense in Cyprus, the Czech Republic, Slovenia, and Slovakia. And the increase in this indicator in much less intense than that observed for the previous ones in Croatia, Lithuania, and Latvia. Overall, this evidence suggests that there is not a perfect correspondence between the support for the EU project and the degree of trust in the EU of citizens in each member state. The differences in the evolution of these indicators are confirmed when comparing their degree of persistence. As deduced from the graphs of the bottom of Figure 3.3, changes in the degree of trust are far more frequent and intense than in the indicators of support. As reported in Table A3.2 of Annex 3, the persistence in this indicator, measured by the correlation between the values of consecutive subperiods, is much lower for the trust indicator. In fact, it is not statistically different from zero for the EU 13 countries.

Finally, Figure 3.4 shows the results for the other indicator of the citizens' attitudes, the proportion of the population in each country for which the EU conjured up a positive image. Beyond some minor differences for a small number of countries, the general picture derived from this indicator is quite similar to that described before in the case of the citizens' trust in the EU. The only specific feature that is worth mentioning is the higher share of population for which the EU evoked a positive image in a good number of EU 13 countries, particularly in the 2007–2009 subperiod, relative to the proportion of their populations that trusted in the EU. As to the degree of persistence of this indicator, both the graphs at the bottom of the figure and the slopes of the regressions reported in Table A3.2 indicate that it is quite similar to the one of trust in the EU and, therefore, much lower than that observed for the measures of support.

Figure 3.3. Differences between countries in Trust in the EU.

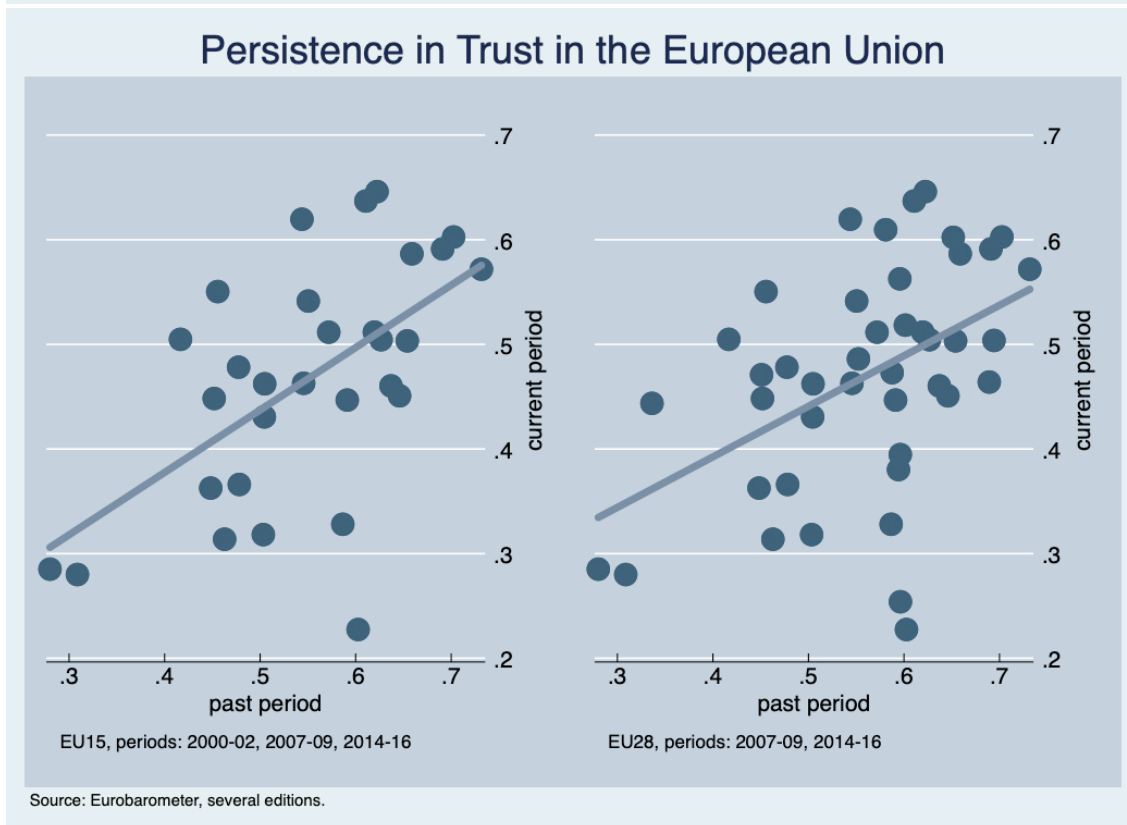
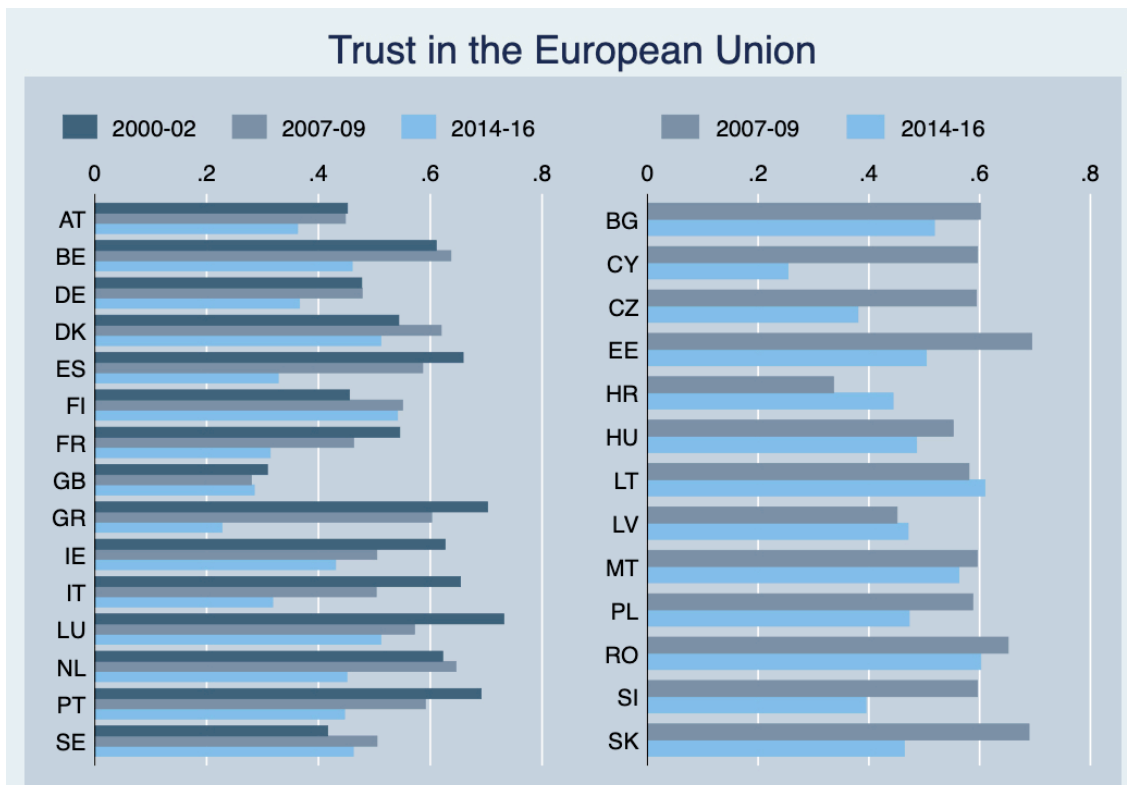
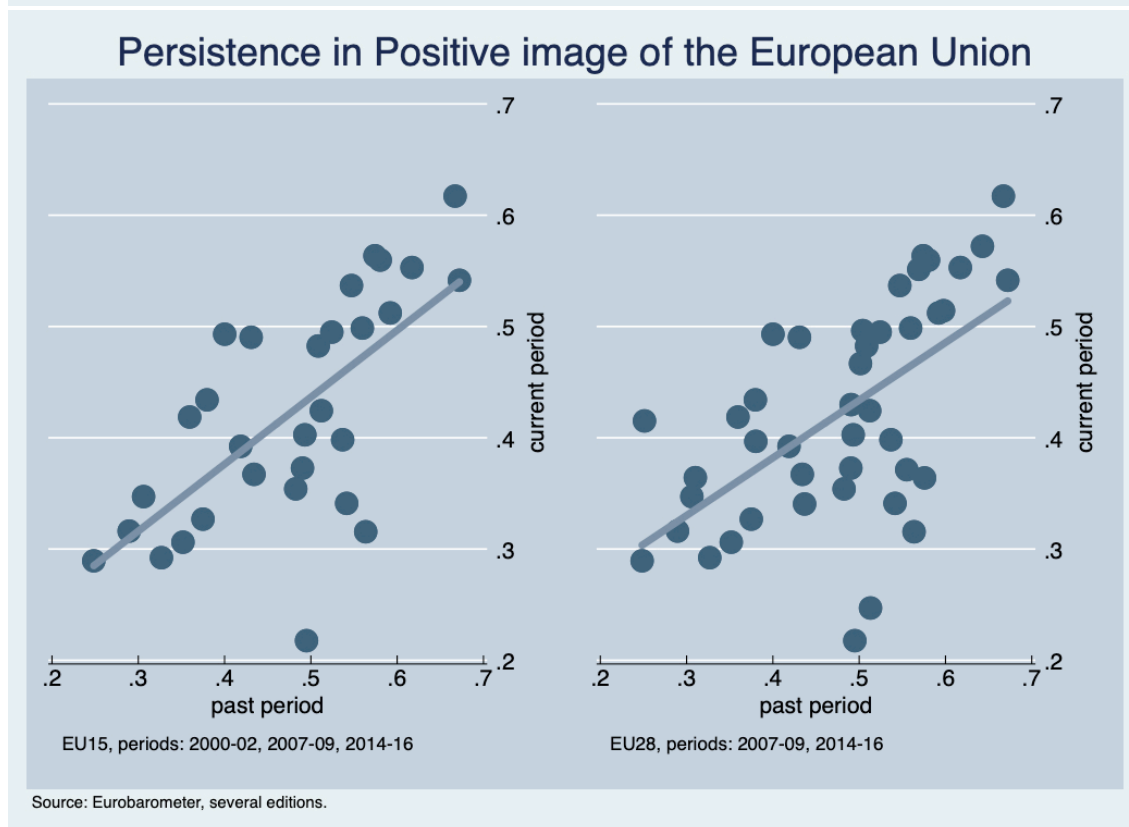
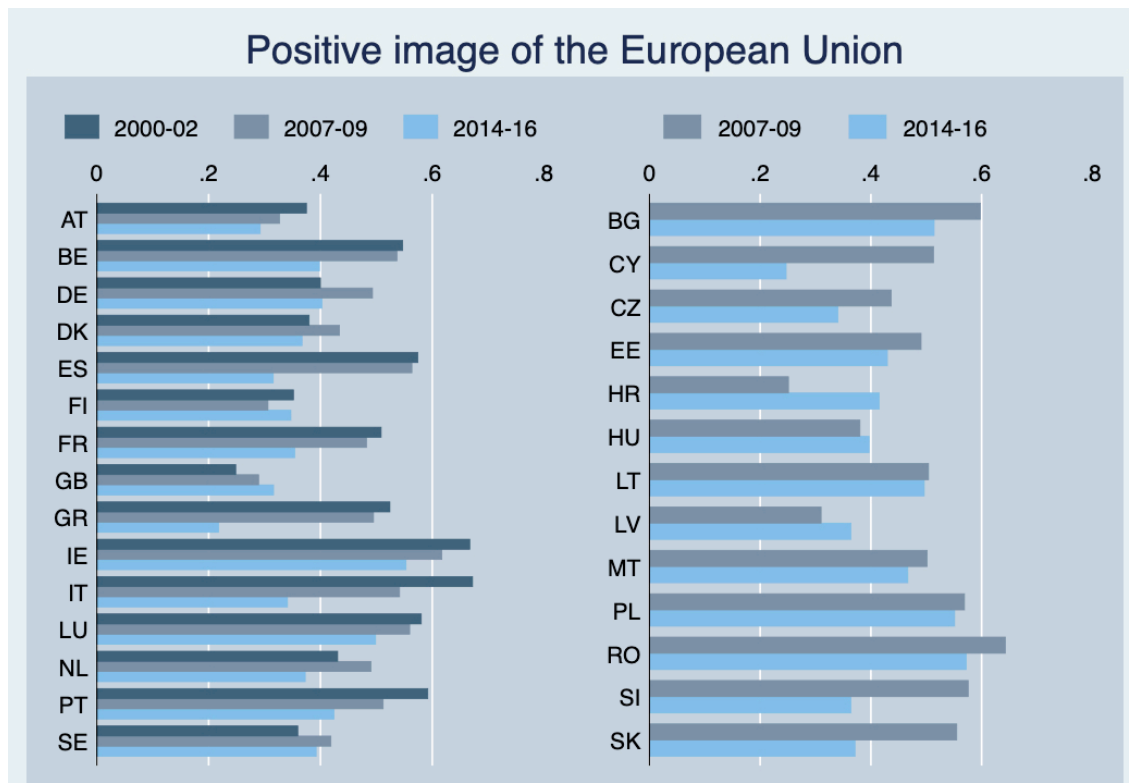


Figure 3.4. Differences between countries in Positive image of the EU.



3.4. Regional disparities.

The evidence reported in the previous section confirms that the EU member states differ in terms of the indicators used to proxy for the degree of support for the European project and attitudes towards the EU. It also allowed us to conclude that the bulk of the differences tend to persist over time, particularly in the case of the indicators of support. However, the analysis at the country level hides the disparities at the subnational level, even though it is well known that EU countries are not homogeneous entities. On the contrary, territorial disparities in key socio-economic magnitudes within member states are sizeable and highly persistent (e.g. Iammarino et al, 2018). Therefore, as long as the socio-economic characteristics affect in one way or another the citizens' perception of the EU, some variation among the regions of a country in the degree of support and in attitudes towards the EU should be observed.

The aim of this section is to provide evidence on the degree of regional disparities in the indicators of support and attitudes, and their evolution over the period analysed. Due to the large number of spatial units (124 for the EU 15 and 56 for the EU 13), the description is based on the estimate of the shape of the distribution of each indicator. To be clear, the density function of an indicator is estimated non-parametrically using the kernel method and the corresponding values for the set of regions (Silverman, 1986). This is done separately for each of the three subperiods considered in the analysis. The comparison of the estimated densities for each subperiod will allow us to conclude on the evolution of regional disparities in the period analysed. In addition, we evaluate the degree of persistence in the regional distribution of each indicator in the same way that we did when describing the differences between countries.²⁰

The results for the indicator of the degree of support for the EU are reported in Figures 3.5 and 3.6. They are complemented with the descriptive statistics reported in Table A3.3 and the estimates of the slope of the regression between the current and previous values of the indicator (as a measure that synthesizes the degree of persistence) in Table A3.4 in Annex 3.

²⁰ As mentioned above, the main conclusions derived from the results in this section are robust to the exclusion of the group of regions with the lowest number of responses after merging the Eurobarometer surveys for the three years in each of the subperiods analysed.

Figure 3.5. Regional distribution of Support to the EU.

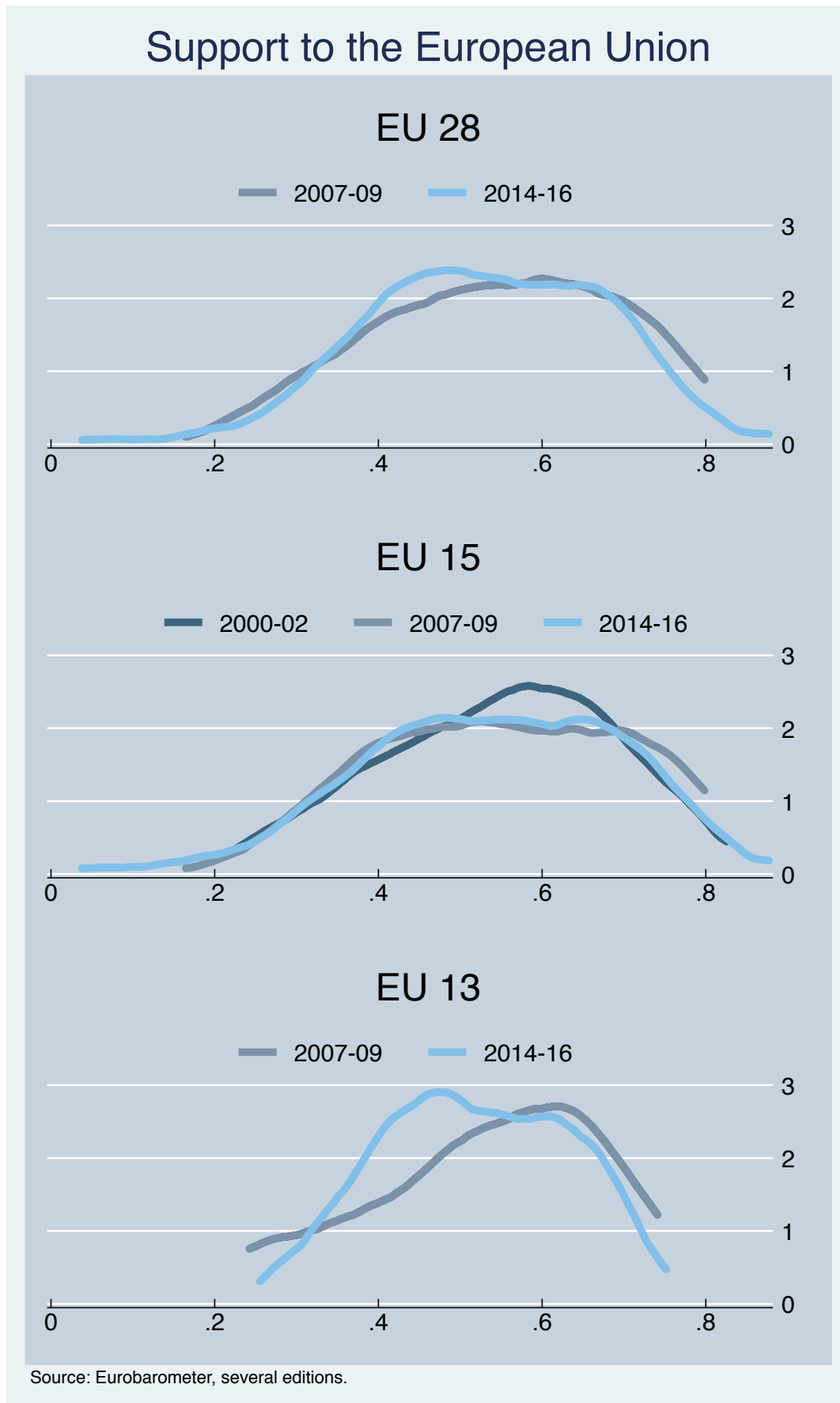
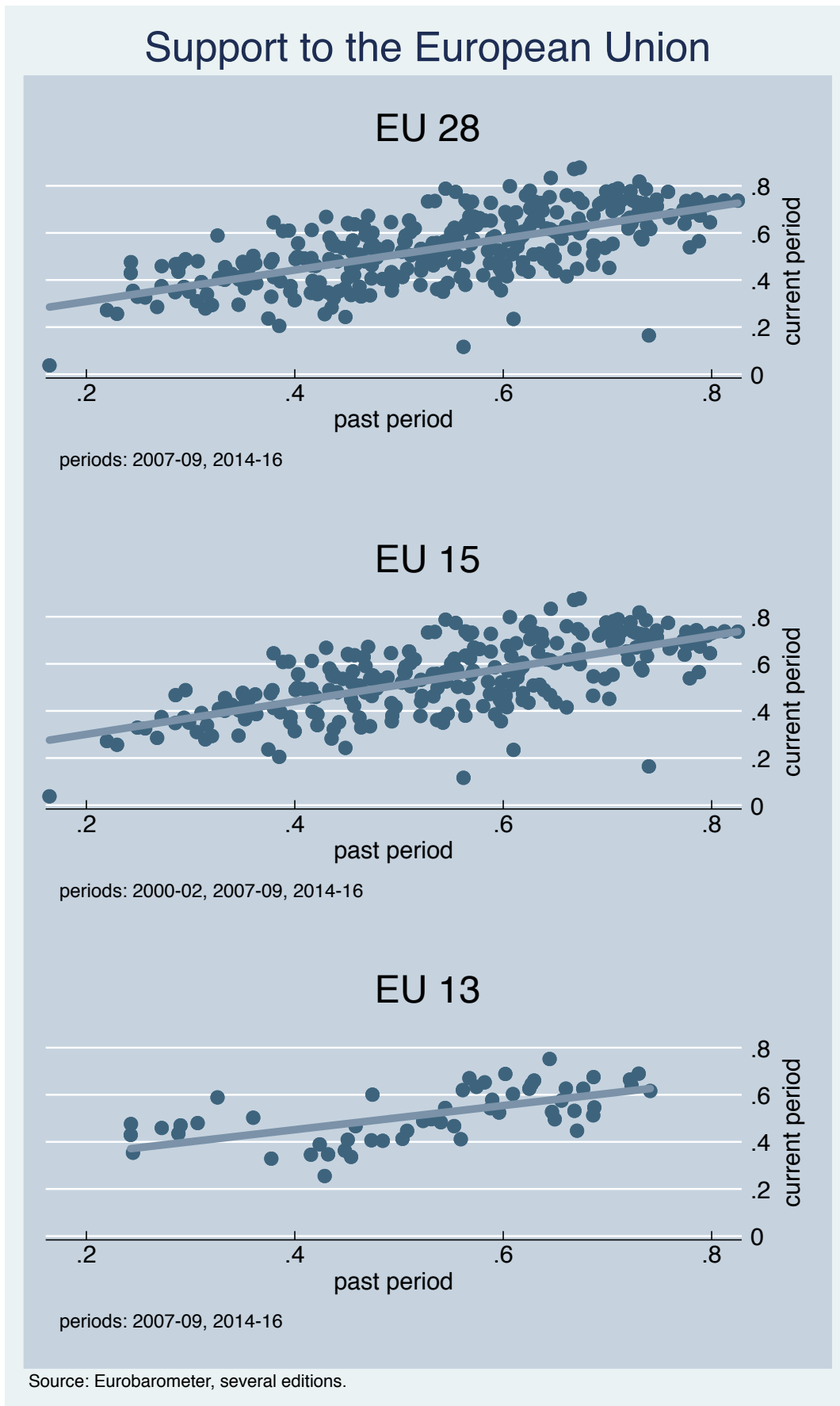


Figure 3.6. Persistence in the regional distribution of Support to the EU.



The densities at the top of Figure 3.5 confirm the existence of very large regional disparities in the proportion of the population that believed that the country's membership of the EU is a good thing. There is a large mass of probability in the 2007–2009 subperiod for low values of the indicator (below 40%) as well as for relatively large values (between 60% and 80%). In other words, the regional distribution of this indicator of support for the EU was rather dispersed at the end of the past decade. The shape of the distribution changed somewhat in the last subperiod. A sort of polarization is observed, due to the concentration of the probability at the left of the distribution in values slightly below the 50% and at the right part in values close to 70%.

The densities for the groups of EU 15 and EU 13 regions suggest that polarization is caused by the evolution of the indicator in the regions of the newest member states. This is so particularly as regards the concentration of the mass of probability at the left of the distribution for the EU 13 regions in the last subperiod. Actually, the comparison of the densities for the two subperiods in this group of regions shows a clear change in the shape of the distribution and a shift of the mass of probability towards the left. That is to say, there was a decrease in support for the EU in a good number of regions of the newest member states. By contrast, no major changes are observed for the set of EU 15 regions between the second and third subperiods. The only remarkable change for this group is observed between the first and second subperiods, as the mass of probability around the 60% in 2000–2002 vanished in 2007–2009, what contributed to increase the dispersion in the regional distribution of the indicator.

These changes in the regional distribution of support for the EU do not prevent a high degree of persistence in this indicator during the period analysed, as shown in the graphs of Figure 3.6. Therefore, it can be said that the current values of the indicator for a representative EU region are strongly (and significantly –see Table A3.4 in Annex 3) related to those observed in the past.

The same analysis for the indicator that proxies for the perceived country's benefits of belonging to the EU reveals some interesting differences. In this case, the estimated densities are reported in Figure 3.7, whereas the scatterplots linking current and past values are shown in Figure 3.8. It is observed that the regional distribution for the EU 28 evolved from a bimodal density at the end of the 2000s to a unimodal one in the middle of the next decade. This is explained by the increase in the values of the indicator for the regions in the left tail of the distribution, and a certain reduction for some regions in the right part. As a result, the mode at the end of the period was about 60%, although there were still some regions with percentages at both extremes. The inspection of the densities for the two groups of regions reveals a clear contribution of those in the EU 15 countries

(the polarization observed in the density for 2007–2009 vanished in 2014–2016), but also a role for the regions in the newest member states. In the latter case, this is due to the shift to the right of the density at the bottom of the distribution, towards values around 60%. Interestingly, there is also a shift to the right (to values around and above 80%) in the upper part of the distribution for the group of EU 13 regions. As to the comparison with the earliest years of the past decades, the evidence from the EU 15 regions suggests a global increase in the share of population that believed that membership of the EU was beneficial for the country. As can be observed, the densities for the last subperiods are at the right of the one for 2000–2002 (compare also the values for the different periods at the percentiles reported in Table A3.3 in Annex 3).

As a result of these changes, the degree of persistence is somewhat lower in this indicator, although there is still a significant correlation between current and past values, as revealed by the scatterplots and regression lines in Figure 3.8. It should be stressed that the lower persistence observed in this case with respect to that for the other indicator of support for the EU seems to be fully due to the changes experienced by regions in the EU 15 group.

The changes in the regional distribution of the two indicators of attitudes, the one related to the level of trust in the EU and that about the image evoked by the EU, are more striking than those discussed so far for the degree of support for the Union. In the case of the former, the estimated densities are reported in Figure 3.9, whereas the scatterplots showing the correspondence between current and past values are shown in Figure 3.10. A dramatic shift to the left of the distribution is observed for the entire set of regions in the EU 28, and for the two sub-groups. In other words, there was substantial decrease in trust in the EU in the entire set of its regions. The shift to the left seems to begin in the early 2000s, although was probably intensified by the financial and sovereign debt crises. The evidence from the set of regions under analysis suggests that the decrease in trust between 2000–2002 and 2007–2009 was due only to the decline of the proportion of population that trusted the EU in those regions that trusted most at the beginning of the period. In fact, there are almost no changes between the first two subperiods among the regions with the initially lowest degree of trust. By contrast, after the crises the shrinkage in trust was generalized in the entire set of regions analysed. In addition, particularly in the case of the group of EU 13 regions, the reduction in the level of trust run parallel to an increase in the degree of dispersion, i.e. in regional disparities. Overall, disparities across regions in trust in the EU were quite large, especially by the end of the period analysed.

Figure 3.7. Regional distribution of Beneficial to belong to the EU.

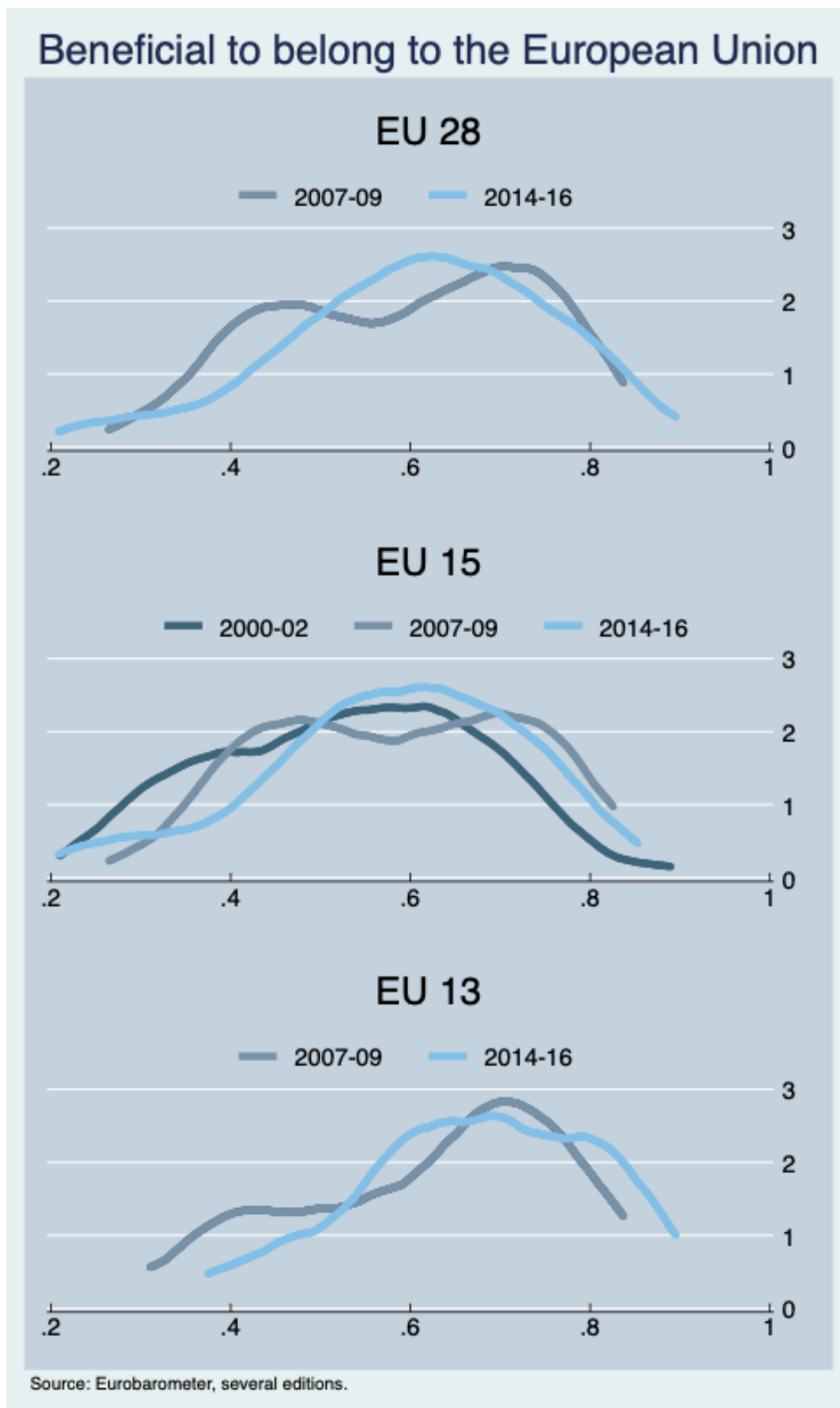
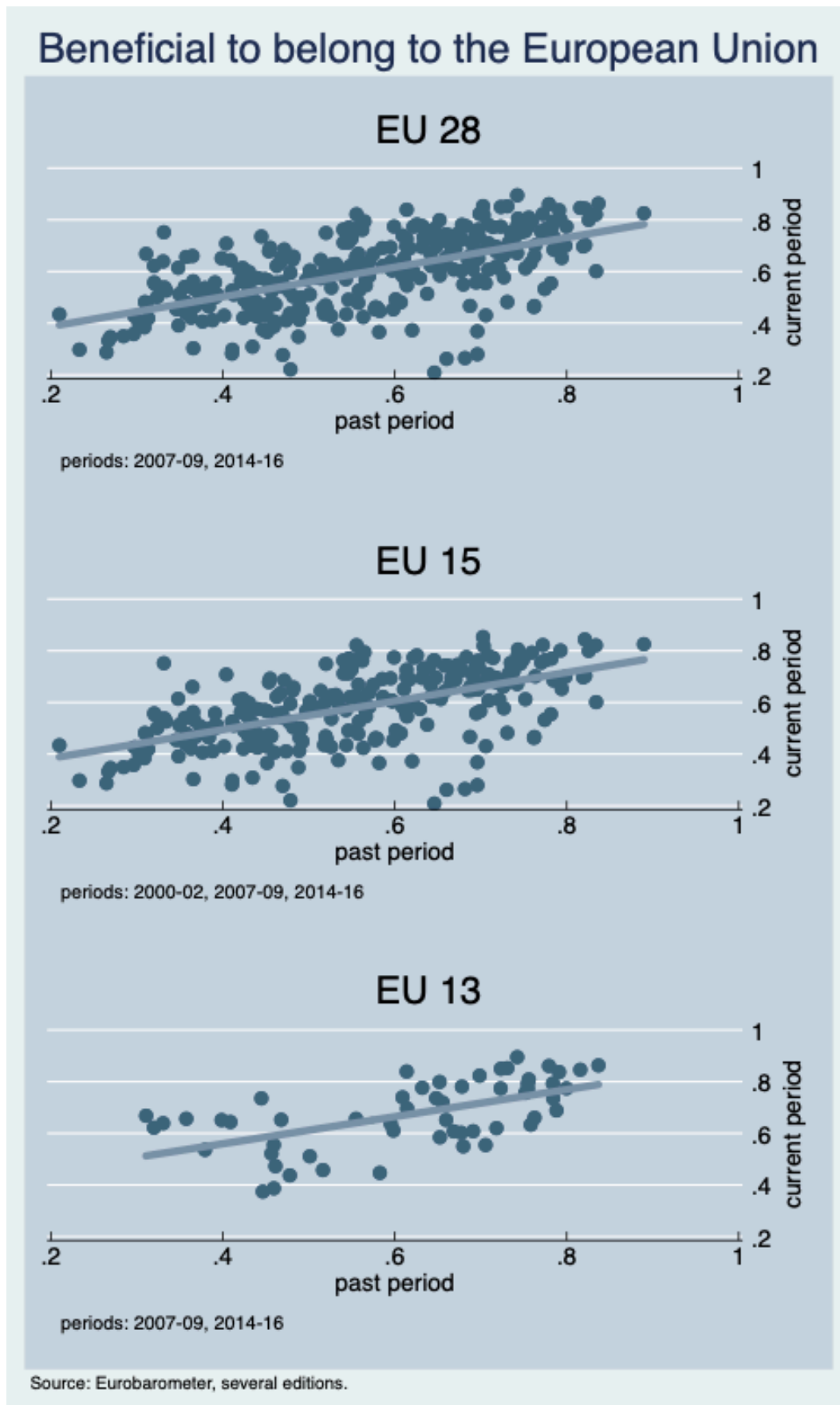


Figure 3.8. Persistence in the regional distribution of Beneficial to belong to the EU.



Regarding persistence in the trust indicator, the scatterplots and regression lines in Figure 3.10 (see also the estimate of the slopes in Table A3.4 in Annex 3) point to lower dependence of the current values to the past values. This confirms turbulences in the regional distribution of trust that led to changes in the relative values (and positions in the ranking) of a good number of regions.

The general picture derived from the analysis of the densities (Figure 3.11) and scatterplots (Figure 3.12) for the proportion of individuals in each region for which the EU evoked a positive image, is quite similar to the one for the degree of trust in the EU. The distribution of the set of regions for this indicator shifts clearly to the left between 2007–2009 and 2014–2016, both in the cases of the EU 15 and the EU 13. There were also some changes in the distribution between the first and last years of the past decade in the EU 15 regions, that are in any case trivial when compared to the evolution of the distribution in the last part of the period analysed. An additional evidence worth mentioning is that the positive image of the EU was in general more frequent among the EU 13 regions than in the EU 15 group. This is a feature which is also observed in the case of trust in the EU. Finally, it should be mentioned that persistence in the indicator of the positive image of the EU is much lower than in the previous cases, particularly in the group of EU 15 regions between the last two subperiods.

Overall, this descriptive evidence suggests that the regional attitudes towards the EU are far more volatile than the proportions of regional populations that support the European project. Since these differences in the regional distribution of the indicators, and in its evolution, may be provoked at least in part by the different impact of the socio-economic circumstances of the regions, the analyses in the following sections will made use of all of them.

Figure 3.9. Regional distribution of Trust in the EU.

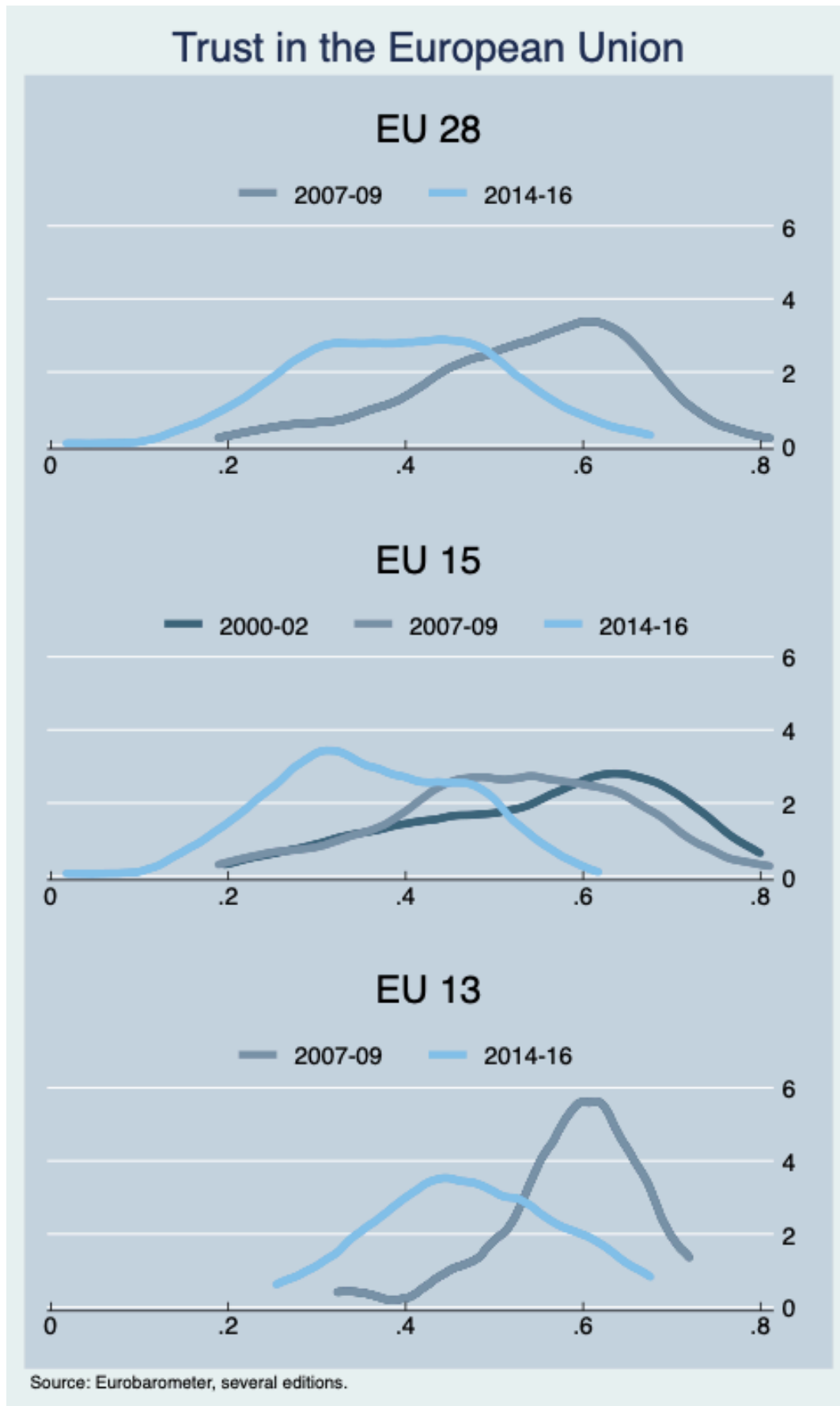


Figure 3.10. Persistence in the regional distribution of Trust in the EU.

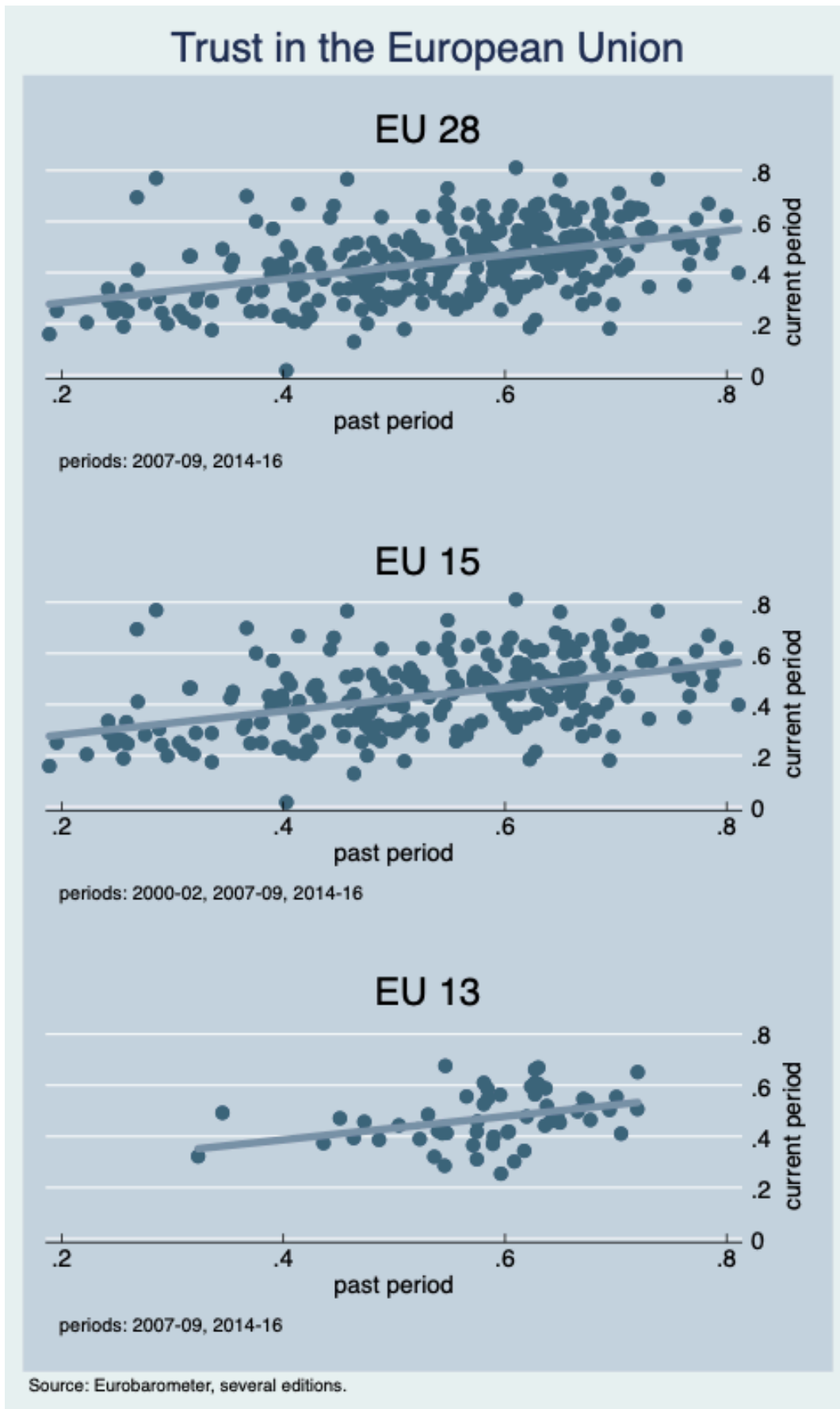


Figure 3.11. Regional distribution of Positive image of the EU.

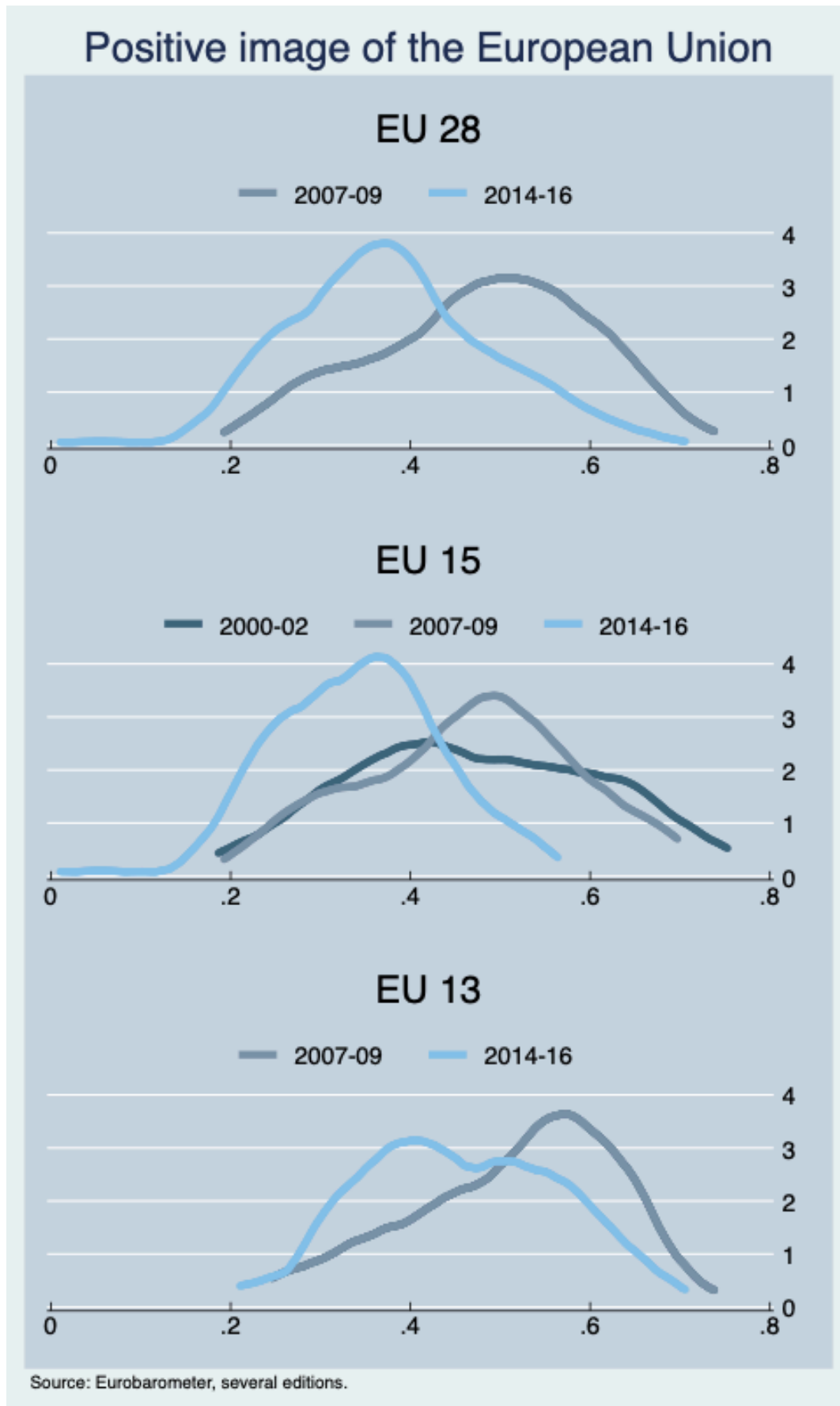
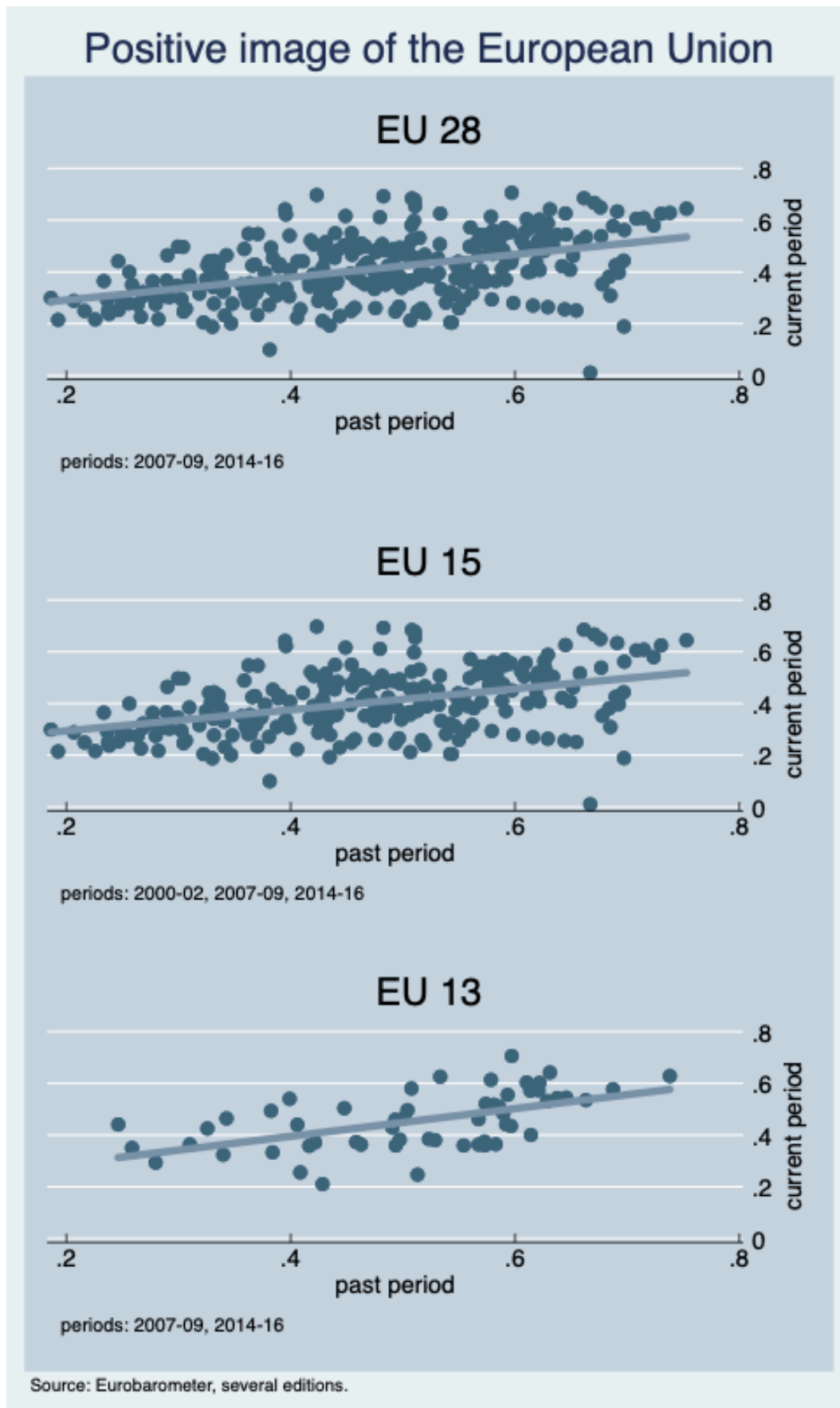


Figure 3.12. Persistence in the regional distribution of Positive image of the EU.



3.5. Summary of results.

The main results derived from the description of the disparities between the EU countries and regions in the aggregate indicators proxying for the degree of support for the EU project and the citizens' attitudes towards the EU can be summarized as follows:

- i. There are sizeable differences between countries and regions in the degree of support for the EU. They also differ in terms of the proportion of the population that trust in the EU, and in the proportion of individuals for which the EU evokes a positive image, i.e. in the citizens' attitudes towards the EU. These differences are observed within the entire set of EU 28 member states as well as within the groups of the oldest and newest members.
- ii. Overall, the share of population in the EU 13 group of countries that believed that belonging to the EU is beneficial for the country is larger than the one that believed that EU membership is a good thing. One can speculate that this is because responding to the questions used to compute these indicators, people in these countries take into account in a different way the economic benefits of being part of the EU.
- iii. Differences between countries are also seen in the recent evolution of the indicators of support. In general, the share of population that believed that the country's membership of the EU was a good thing, and beneficial for the country, decreased in countries where the impact of the crisis was more pronounced. Meanwhile, an increase in support is observed in some of the richest northern countries and in some of the newest member states.
- iv. There were interesting changes in the shape of the regional distribution of the indicators of support. A sort of polarization is observed between 2007–2009 and 2014–2016 for the proportion of population that believed that EU membership is a good thing, caused by the decrease in the value of this indicator in a number of regions of the newest member states. Conversely, the regional distribution for the indicator of the country's benefits of belonging to the EU evolved from a polarized to a unimodal distribution. In this case, the evolution of regions in the oldest and newest member states contributed equally to convergence in this indicator.
- v. Trust in the EU decreased in most countries and regions, although the deterioration of confidence was more intense in countries where the sovereign debt crisis was more intense but also in some of the most developed EU economies. Interestingly, the reduction in the level of trust run

parallel to an increase in the degree of dispersion, i.e. in regional disparities, particularly in the case of the group of EU 13 regions. Overall, disparities across regions in trust in the EU were quite large, especially by the end of the period analysed.

- vi. In a good number of EU 13 countries the share of population for which the EU evoked a positive image, particularly in the 2007–2009 subperiod, was higher than the proportion of the population that trusted in the EU. Also, the positive image of the EU was in general more frequent among the EU 13 countries and regions than in the EU 15 group. This is a feature which is observed as well in the case of the indicator of trust in the EU.
- vii. The values of the indicators of EU support in a subperiod correlate highly with those observed in the previous one. In other words, the two support indicators show large persistence over time. Conversely, persistence is much lower in the case of the attitude's indicators. Differences in persistence are also observed in some cases between the groups of oldest and newest member states.
- viii. Overall, the descriptive evidence, both at the country and region levels, suggests that there is no perfect correspondence between the indicators of support for the EU project and the ones accounting for the citizens' attitudes. This confirms the convenience of considering the four indicators in the analyses carried out in the following Chapters.

4. Perception of the EU and Cohesion Policy in the region.

4.1. Introduction.

This Chapter analyses the effect that the implementation of the EU Cohesion Policy in a region has on the support for the EU project and citizens' attitudes towards the Union. It also considers the effect of other social and economic characteristics of the region under the assumption that the socio-economic context shapes the citizens' perception of the EU. Given that the criteria for allocating the funds of the Cohesion Policy is the economic situation of the region (relative to the EU average), neglecting the economic context could lead to confound the effect of the policy on the degree of support and attitudes.²¹

The major assumption of the analysis is that at least part of the territorial disparities in the indicators of the citizens' perception of the EU, reported in Chapter 3, can be explained by differences in the incidence of the Cohesion Policy among regions. This is supported by the argument that transfer payments from the richest to the poorest territories, particularly by means of the regional development funds and the agricultural policy, have generated political goodwill for the EU (e.g. Duch and Taylor, 1997; Fidrmuc et al, 2016; Dąbrowski et al, 2017). Citizens in the recipient regions are supposed to benefit directly or indirectly as long as the EU funds contribute to alleviate the deficits of the local economies. Similarly, the socio-economic context of the region is expected to affect the perception of the EU through different channels. If further economic integration benefits certain economic activities but penalizes others, support for the EU will be more abundant in regions specialized in activities benefited from the integration (Duch and Taylor, 1997). At the same time, if the economic prospects of the EU integration are higher for specific groups of individuals, depending for instance on their education and income, those regions with more educated populations and higher income per capita will be more supportive for the EU project (Tucker et al, 2002).

The indicators defined and described in Chapter 3 are used here as well as proxies for the degree of support for the European project and attitudes towards the Union in the regions of the EU 28, for the three subperiods analysed. They are combined with data on Structural Funds expenditures per capita in the region, and with the regional absorption rates and the alternative measures of efficiency

²¹ This section focuses on the relationship between the Cohesion Policy, the socio-economic regional context, and the citizens' perception of the EU from an aggregate perspective. Deliverable 2.2 provides complementary evidence using individual level data on identification with Europe and support to the EU project.

based on the speed of implementation, introduced in Chapter 2. A comprehensive set of factors accounting for the territorial, institutional, and socio-economic situation in each region, such as the GDP per capita, educational attainment, quality of local governments, population density, and poverty risk are also included in the analyses of this chapter.

In a first stage, the impact of the intensity of the Cohesion Policy, measured by the amount of funds expended in the region, on the citizens' perception of the EU is explored. The hypothesis to be tested is that, other things equal, a more positive perception (higher support and positive attitudes) will be observed in those regions benefited more intensively by the Cohesion Policy. The study is complemented in a second stage with the analysis of the influence of the efficiency in the management and deployment of Cohesion Policy funds in the region. To be clear, we use the regional absorption rates and the measures of speed in the implementation to analyse their correlation with the indicators of support and attitudes. In this way, we aim to provide a more complete picture of the impact of the Cohesion Policy on the perception that citizens have of the EU.

4.2. Perception of the EU project, the region's socio-economic context, and the Cohesion Policy.

Recent threats to the European integration process have renewed interest on the determinants of the citizens' perception of the EU and their institutions. In this context, scholars and practitioners have been increasingly interested in knowing how the socio-economic framework of countries and regions shapes mass attitudes towards the EU and, in line with one of the main objectives of the PERCEIVE project, if the EU policies in general and the Cohesion Policy in particular affect the people's perception of the European integration process.

There is abundant evidence on the relationship between macroeconomic fluctuations and electoral outcomes, that has been extensively studied in the political business cycle literature (Nordhaus, 1975; Grier and McGarrity, 1998). However, in the case of the EU, Duch and Taylor (1997) argued that the imperfect public accountability of the EU policies with economic impact prevents that citizens make the link between the economic outcomes and the EU. Therefore, macroeconomic fluctuations cannot be expected to have a strong effect on the perception of citizens about the EU since most of them do not consider the Union as responsible for macroeconomic policies. In other words, it is assumed that variations in aggregate national magnitudes such as growth rates, inflation, and unemployment do not determine support for the EU project. Conversely, economic factors may shape attitudes toward the EU in terms of comparative advantage. Individuals in territories more benefited from integration can be

thought to have a better perception of the EU than the potential losers. In fact, the concept of winners and losers of EU integration gained momentum from the acceleration of the process of economic and political integration (e.g. Tucker et al, 2002).

The level of income, employment prospects, and educational attainment are natural candidates in the list of regional economic factors that are expected to condition the perception about the EU in a region. But other elements of the regional context could play a role as well. Dąbrowski et al (2017) has suggested a typology of regional indicators that can potentially shape the attitudes towards the EU. Among the groups they considered in the study, the following three are of particular interest for the empirical analysis carried out in this section:²²

- Territorial indicators. In the first place, support for the European institutions and attitudes towards the EU can well vary between urban and rural areas, and even between cities of different size. For example, it is well known that highly skilled and better paid individuals are overrepresented in denser areas (e.g. Glaeser and Maré, 2001). Since there is wide consensus as regards the effect of these personal characteristics on the individuals' degree of identification with Europe (e.g. Verhaegen et al, 2014), it is sensible thinking that attitudes towards the EU will vary between areas of different size. The degree of urbanization and the population density of the territory can be used as proxies to capture this effect.
- Governance indicators. The quality of the institutional framework affects not only the economic performance but also several other dimensions of individuals, such as their social attitudes. In this sense, people in a country or region of a low institutional quality can see the EU and its institutions as a protection against the discretion and malfunction of the national and/or local authorities. Therefore, under this substitution effect (Bellucci et al, 2012), the image evoked by the EU will be more positive in regions with a poor institutional quality (e.g. widespread corruption). In addition to this mechanism, institutional quality can also affect the perception of the EU if honest and capable regional governments make more efficient and effective use of the EU funds allocated in the region. Also, if they accredit the EU as responsible for the benefits of the policy in the region. Indicators of the quality of the regional government are therefore expected to correlate positively with the measures of support for and positive attitudes towards the EU.

²² We just focus on the indicators used in our study. For a discussion on the full list of indicators see Dąbrowski et al (2017).

- Socio-economic indicators. The economic utilitarian theory suggests a link between the assessment of the economic costs and benefits of the integration and the extent of the support for the EU (Gabel, 1998; Verhaegen et al, 2014). To be clear, under this theory, citizens' support for the EU is positively related to their welfare gains of integration. It can be therefore assumed that support will be wider in regions where the economic benefits outweigh the costs. Gabel and Palmer (1995) postulated that liberalization of capital and labour markets, a common currency –centralized monetary policy–, and free trade of goods and services affect citizens differently depending on their level of income. Similarly, the level of education and individual skills are crucial to adapt to the changes in the labour market originated by the above-mentioned processes. Besides, more educated individuals are also more aware of politics and are better able to evaluate messages sent by political elites and the media. Hence, the average income and educational attainment in a region are expected to correlate positively with optimistic attitudes toward the EU, as a wider portion of the population will benefit from integration in rich and highly educated territories. In a similar vein, regions with low employment opportunities (high unemployment and/or low participation in the labour market and, thus, high risk of poverty) will barely benefit from integration, leading to low support for the EU.

The empirical analysis in Duch and Taylor (1997) supports the argument that regions with higher levels of socio-economic standings, measured by income level, education, and unemployment, are more prone to greater European integration. This is consistent with the evidence from the study on the regional results in the Brexit referendum by Fidrmuc et al (2016). They conclude that support for EU membership, i.e. lower share of Brexit votes, was higher in areas that did economically well. To be clear, GDP per capita and average hourly wage turn out to be strong predictors of the remain vote, while the effect of the employment rate is positive although not statistically significant. In any case, there is an important feature mentioned by Duch and Taylor (1997) that is worth mentioning. It is that the positive effect of the variables proxying for the socio-economic context of the region is significant but only before the generalized increase in support for the EU at the end of the 80's, that they claimed was driven by the elites. Their results thus suggest that the influence of the regional socio-economic context, and by extension of the territorial and institutional determinants, may vary depending on the overall levels of European support. To be clear, their effects will be lower when overall support is high, and regions become less differentiated as regards their citizens' perception of the EU.

An important economic aspect that is expected to shape the citizens' perception of European integration is the amount of EU transfers in the region. Contributions to the political economy literature point to the interaction between the allocation of regional transfers and the incumbent's vote share at the elections ('vote purchasing'). Upper-tier governments can allocate funds in a strategic manner in an attempt to influence the election results (Osterloh, 2011). Based on similar arguments, in the case of the EU it can be argued that citizens from regions where the Cohesion Policy is more intense (recipients of more funds) may want to reward EU institutions with a more positive attitude towards the integration process. In fact, this could be a side effect (conscious or not) of the policy aimed at helping the less developed territories of the Union to converge with the more advanced ones. If this were the case, we should observe a positive correlation between the intensity of the Cohesion Policy in the region and the share of its population that supports the EU project. However, the fact that the amount of Cohesion Policy funds, and eligibility for specific funding objectives, are allocated according to the level of income in the region makes it difficult to establish a univocal relationship between the intensity of the policy and the mass attitude towards the EU. This is so because, as mentioned above, lower income levels are usually associated to less support for integration. Therefore, the low portion of wealthy people in regions with large allocations of EU funds may lead to a negative correlation between the intensity of the Cohesion Policy and support for the EU. In other words, the animosity of people in the less developed regions who are subsidized by Cohesion funds could undermine support, counteracting the effect of regional transfers aimed at compensating for territorial disparities in comparative advantages.

The empirical evidence on the net effect of the Cohesion Policy in the region on the attitude of citizens toward the EU is inconclusive. Initial studies using data for the 1980's conclude against a positive effect of the policy. Duch and Taylor (1997) obtained a negative correlation between the amount of regional development funds per capita and support for the EU in the period 1983 to 1989. However, the coefficient of interest is not statistically significant and, above all, the number of regions considered in their analysis is rather limited (40 in basic regressions and 27 when regional controls are included). In any case, they concluded that regional subventions are not effective for building support for the EU. Indeed, they stated that EU funds allocated to targeted regional populations are heavily discounted because individuals make a robust assessment of their comparative advantage, and hence fail to build support for European integration in the less developed regions.

More recent studies, covering the period since the late 1990s, are more optimistic about the effect of the Cohesion Policy in shaping support for the EU.²³ Osterloh (2011) found a positive impact of the Structural Funds payments per capita in the region on support for the EU in the period from 1995 to 1999. This study also points to two interesting pieces of evidence. The first is that there may be spatial spillovers at work, since the positive effect of the policy on EU support seems not to be restricted to the recipient regions, but spills over other regions within the country. Secondly, Cohesion Policy funds are far from having homogeneous effects across population groups. In particular, highly educated people are more aware of the policy and react more strongly to the Structural Funds spent in the region than the low educated. This heterogeneous effect of the policy is supported by the results in Chalmers and Dellmuth (2015) using data from the spring Eurobarometer of 2010 merged with the total sum of Structural Funds investments per capita in a region during the period 2007–2013. Their evidence suggests that the effect of regional transfers depends on communal identity (feelings of EU citizenship) and education, which they claimed are not in the hands of the European institutions. In a more recent study, Dellmuth and Chalmers (2018) argue that it is important to consider how transfers are spent. In particular, based on results for 127 EU regions in 13 member states during the period 2001 to 2011, they show that support for the EU increases with the fit between the economic needs in the region and EU spending on three areas: human capital, infrastructure and environment.

Evidence on the positive effect of the intensity of the Cohesion Policy in the region on the building of a European identity is also supported by results from Deliverable 2.2 of the PERCEIVE project and from the COHESIFY project. In both cases, individual-level data from original surveys allow to control for alternative mechanisms of the formation of the European identity, and the determinants of citizens support for the EU. In particular, Borz et al (2018) exploit data from a survey in 17 regions of 12 member states to conclude that there is clear evidence of the positive impact of the Cohesion Policy on European identity. They also claim for the effect of the awareness of the policy among the citizens of the region. In fact, respondents that said that they benefited in their daily life from EU investments identified more with Europe than those that do not. Meanwhile, López-Bazo and Royuela (2017) use data for respondents in 137 regions of the 15 EU countries included in the PERCEIVE survey. They conclude that the degree of identification with Europe and the support for the EU project increase significantly with the amount of Structural Funds spent in the region. They also show that the

²³ This is not the case in the study of Verhaegen et al (2014). However, they consider the effect of the amount of EU funds received in the country instead of in each region.

amount of EU funds in the region affects awareness and the positive perception of the policy, and that the effects can vary between individuals living in rural and urban areas, and even between cities of different size.

Other recent studies have exploited data on pro-European versus Eurosceptic or even anti EU voting to conclude on the effect of the EU regional policy on public attitudes towards the integration process. Fidrmuc et al (2016) analyse the relationship between the intensity of the Cohesion Policy in the NUTS 2 regions of the UK and the Brexit vote in the 2016 referendum, concluding that European transfers played virtually no role in the results. A similar conclusion has been reached in the study of Crescenzi et al (2017), using more disaggregated spatial data (electoral wards) and a sophisticated method to identify the causal effect of EU funds on the Brexit vote (spatial regression discontinuity design). Nevertheless, their results suggest that the 'Remain' vote was higher in the less developed areas where the EU investments had visible effects on the local labour market conditions. The impact of the effectiveness of the Cohesion funds spent in the region and the pro-European voting has also been highlighted in the case of the French presidential elections of 2017 by Bachtrögl and Oberhofer (2018). They measure effectiveness in terms of employment growth in the set of firms benefited by EU funds in the French NUTS 3 regions, observing that it correlates negatively with the vote shares for the Eurosceptic candidate.

Overall, the extant literature is not conclusive about the effect of the Cohesion Policy on the citizens' attitudes towards the EU. Only the most recent studies have derived a significant positive effect under certain circumstances, and using micro-level data or results in recent elections in specific EU countries. In fact, the evidence from aggregate regional data on the perception of the EU in a numerous group of member states is rather scarce. The following sections intend to contribute to filling this gap.

4.3. Dataset and variables.

The indicators defined and described in Chapter 3 are used as proxies for the degree of support for European integration and the citizens' attitudes towards the EU in the regions of the EU 28. For those in the oldest member states, data for the indicators is used for the three subperiods considered in the analysis: 2000–2002, 2007–2009, and 2014–2016. However, lack of information in the Standard Eurobarometer surveys for the EU 13 regions before their countries joined the Union prevents including this group of regions in the first subperiod.

The data on the regional indicators of the citizens' perception of the EU are combined with figures on the amount of Structural Funds expended in each

region, and with the battery of socio-economic magnitudes compiled in the PERCEIVE regional dataset (see Deliverable 2.1). The two datasets were merged using the regional codes that univocally identify the regions in the latter. These codes were also appended to the Eurobarometer micro-dataset by the UGoT team, using their correspondence with the NUTS classification. In the case of some socio-economic indicators data is not available for some of the regions for which the indicators of the perception of the EU have been defined.²⁴ As a consequence, specifications that include them has been estimated with a lower number of regions. In the worst case (when using the measures of poverty), 120 regions are used to estimate the coefficients of interest. In general, the number of regions used in the analysis (about 175) is far above the one used in previous studies using aggregate data (e.g. Duch and Taylor, 1997). Interestingly, they are from a numerous and heterogeneous group of EU member states, in contrast with studies that only exploit data from a single country (e.g. Fidrmuc et al 2016).

The specific measure used to account for the intensity of the Cohesion Policy in the region is the amount of total Structural Funds expenditures per capita in the year previous to the period in which the indicators of perception are measured. To be clear, for example, the total amount of Structural Funds spent in the region in 2013 was assigned to the 2014–2016 period. It is worth noting that, due to the stability shown by the figures of EU expenditures in each region, we obtained similar results when using the data of the Structural Funds in adjacent years, and when computing an average of consecutive years.

In addition to the intensity of the policy, in section 4.4.2 we assess the influence of efficiency in the deployment of the Cohesion Policy funds in the region on its citizens' attitudes towards the EU. In the first place, a traditional indicator is used. This is the so-called absorption rate, defined as the ratio between the amount of funds effectively spent in the region over the lifetime of the programming period 2007-2013²⁵ and the amount allocated to the region. Alternatively, we use the measures that might better capture the effective use of the allocated resources in the region. These are the measures of the speed of implementation defined in Chapter 2. On the one hand, the percentage of expenditures accumulated after five years of implementation of the programme, that is to say, from 2007 to 2011.

²⁴ This is the case of the variables defined as ratios. As described in section 3.2, responses in Eurobarometer surveys in some regions were combined with those in neighbouring regions to increase the number of responses used to compute the regional indicators of EU perception. In these cases, the ratios for the groups of regions that were combined can not be computed from the values in the PERCEIVE regional database.

²⁵ Payments made by the European Commission until 2016 as in the figures published in June 2018 (for more details see Chapter 2).

On the other, the number of years needed to accumulate 50% of the amount allocated to the region.

As to the measures of the socio-economic situation of the region, we consider the gross domestic product per inhabitant (GDP per capita), the percentage of the regional population between 25 and 64 years old with tertiary education –ISCED levels 5 to 8–, the employment rate, and two indicators measuring the poverty level in the region: the risk-of-poverty rate and the rate of social exclusion. GDP per capita is measured in purchasing power standards to account for differences across countries in the cost of living. However, it does not discount price differences within countries. We prefer to use the employment rate instead of the unemployment rate because regions in the sample differ greatly in participation rates. The employment rate is defined as the ratio between the employed and the working age population (15 to 64 years old) in the region. Finally, the risk-of-poverty rate is the percentage of the region's population with an equivalized disposable income below the risk-of-poverty threshold.²⁶ The rate of social exclusion adds to the persons in risk of poverty those being above the risk-of-poverty threshold but severely materially deprived or living in households with very low work intensity. The primary source of information for the construction of the poverty indicators is the EU statistics on income and living conditions (EU-SILC). Since it is available from 2003 onwards, we cannot include the first subperiod (2000–2002) when analysing the relationship between poverty and citizens' attitudes towards the EU. In addition, the poverty indicators are only available for a limited number of NUTS 1 and NUTS 2 regions. In particular, after merging them with the perception indicators we have the information only for 55 regions in the second subperiod and 65 in the third subperiod.

To study the effect of territorial disparities, and more precisely of the agglomeration of population, population density is considered. It is defined as the annual average population per square kilometre in the region. In turn, the quality of the institutional framework is proxied by the European Quality of Government Index (EQI). The index is computed based on survey data on regional level governance in the EU by The Quality of Government Institute (Charron et al, 2014 and 2015). Data is available for 2010, 2013 and 2017. Therefore, it is possible to combine data on the EQI with the indicators of the perception of the EU only for the last subperiod. In particular, the results in the next section are obtained using the EQI for 2013, as it includes more regions than the 2010 edition (206 in 2013 versus 172 in 2010). In any case, after combining these data with those of the EU

²⁶ It is set at 60% of the national median equivalized disposable income.

perceptions, the sample was reduced to 148 regions. Higher scores imply higher quality of government and, thus, a better institutional framework in the region.

Finally, we consider the percentage of total employment in agriculture, as a proxy of the influence on the region of the other large source of EU funds, the Common Agricultural Policy. As in the case of the Cohesion Policy, one can expect effects of this policy on support for the EU, which will be larger the more important the primary sector is in the regional industry mix.

Simple descriptive statistics of the Structural Funds expenditures per capita and the measures of the regional context defined above are reported in Table A4.1 of Annex 4. The statistics are computed for the sample that pools the available observations in the three sub-periods and for each separate sub-period. The number of regions for which data is available in each case is also reported. In this regard, it should be mentioned that the descriptive statistics correspond to the samples of regions that are effectively used in the estimation of each particular specification (as detailed in the next section).

4.4. Results.

The first part of this section analyses the relationship between the intensity of the Cohesion Policy in the region and the indicators of the citizens' perception of the EU, together with the association between the latter and the different territorial, institutional and socio-economic variables. In a first step, simple regressions are run to assess the amount of correlation of each individual indicator:

$$Perception_EU_{it} = \alpha + \delta_t + \beta \cdot X_{it} + \varepsilon_{it} \quad (1)$$

where *Perception_EU* refers to any of the four indicators of the citizens' perception of the EU, and *X* a single indicator in the list described in the previous section, including the amount of Structural Funds expenditures. δ_t denotes period fixed effects. The subscripts *i* and *t* refer regions and periods, respectively. The coefficient of interest is β , which captures the effect of the corresponding measure of the region's context on the indicator of perception. It should be noted that region fixed effects are not considered because the interest at this stage is just the appraisal of the raw relationship between the variables.

In a second stage, the effect of the Structural Funds expenditures per capita in the region is estimated in a regression that includes the measures of the regional context as controls. To be sure, the specification to be estimated is as follows:

$$Perception_EU_{it} = \alpha_i + \delta_t + \beta \cdot SF\ pc_{it} + Z_{it}\gamma + \varepsilon_{it} \quad (2)$$

where *Perception_EU* is defined as before, *SF pc* refers to the (log of) Structural Funds expenditures per capita, *Z* is a vector of controls, including the (log of) GDP

per capita, the share of population with tertiary education, the employment rate, and the (log of) population density.²⁷ Finally, α_i and δ_t denote region and period fixed effects, respectively. The coefficient of interest is β , which in this case captures the effect of the Cohesion Policy funds in the region on the perception of the EU. Specifically, when total Structural Funds expenditures per capita increase by 1% in the region, the corresponding indicator of perception of the EU will increase in $100 \cdot \beta$ percentage points.

A similar analysis is performed in the second part of the section with respect to the effect of the efficiency in the management and deployment of the Cohesion funds on citizens' perceptions in the region. Therefore, we first estimate the raw effects from single regressions using the measures of the speed in the implementation of the Structural Funds described above. Then, the effects net of the influence of the factors that proxy the regional context are estimated using a multivariate framework, where the corresponding measure of speed is added as an additional regressor in equation (2).

4.4.1. Effects of the intensity of the Cohesion Policy and the region's context.

The estimates of the coefficients associated to the Structural Funds expenditures per capita in the region and the measures of the regional context on the four indicators of the citizens' perception of the EU are reported in Tables 4.1 to 4.4. The ones from the simple regressions are shown in a first group of columns (i to ix), whereas those from the multivariate framework are in the last two columns (x and xi).

As to the raw effects on the first indicator of support for the EU, column (i) in Table 4.1 shows that the correlation between the amount of Structural Funds spent in the region and the proportion of its population that believed that the country's membership of the EU is a good thing is negative (and statistically significant at 5%). A 1% increase in the amount of expenditures per capita decreases support in the region by 1.6 percentage points (p.p). In other words, there is less support for

²⁷ The other measures of the region's context (quality of government, poverty and social exclusion, and agricultural employment) were not included at this stage to avoid the reduction in the number of regions used in the analysis, and because they are not available for the three subperiods. As will be discussed later, only the coefficient of the measure of institutional quality is significant in the individual regressions. In any case, the inclusion of these measures for the periods and regions for which they are available does not change the general conclusion on the effect of the Cohesion Policy variable. This is particularly so in the case of the share of employment in the primary sector, that proxies for the effect of the EU Common Agricultural Policy, and is only available in the PERCEIVE regional dataset for the last subperiod.

the EU in regions that benefit most from the Cohesion Policy. This is consistent with the fact that the relationship between support to the EU and GDP per capita in the region is positive, and highly significant. Increasing income per capita by 1% leads to a substantial rise in support, of almost 8 p.p. Therefore, the coefficient in the single regression for the intensity of the Cohesion Policy may well be capturing the lowest support in the less advanced regions, i.e. those that received the bulk of EU funds. As in the results of previous studies, support also correlates positively with the share of highly educated population in the region. The estimated coefficient suggests that increasing the proportion of population with tertiary education by 10 p.p. would rise support by 3.4 p.p. Overall, the results from the simple regressions confirm that support for the EU is more widespread among the most advanced regions, which leads, at least in part, to less support in the regions most benefited by the Cohesion Policy. Interestingly, the proportions of people at risk of poverty and social exclusion do not correlate with the measure of support. This is against the hypothesis that the higher the percentage of discontented people in the region (i.e. losers of the ongoing processes of integration, globalization, robotization, etc.) the lower the support for the EU integration process. However, it should be kept in mind that data for the two measures of poverty are only available for a subset of regions and for the last sub-period analysed.

On the other hand, the results in columns (v) and (vi) confirm positive and significant relationships between support for the EU and the measures of territorial and institutional quality. To be sure, support is higher in denser regions and in those with governments of better quality. By contrast, the proportion of employment in the primary sector does not seem to correlate with support for the EU. As long as this measure is really capturing the impact of the Common Agricultural Policy in the region, it cannot be said that this policy is associated with higher citizens' support for the EU. However, it should be stressed that the estimate of the effect for this measure exploits the data available only for the last sub-period.

The results of the estimation of the effect of the Structural Funds expenditures per capita controlling for the set of regional characteristics for which the data is available in the three sub-periods are reported in columns (x) and (xi) of Table 4.1. The difference between the two is the inclusion in the last column of region fixed effects. They account for unobservable regional characteristics that are expected to affect the degree of support for the EU, and correlate with the amount of Structural Funds in the region and with the other measures of the regional context. It can be observed that the coefficient associated to the EU funds is non-significant in both specifications. This confirms that the significant negative effect

derived from the simple regression in column (i) can be attributed to the omission of the variables accounting for differences in the socio-economic context, in particular GDP per capita. In fact, the high collinearity between the different measures prevents the identification of the specific effect of each factor. Only the coefficient of population density, in the specification that does not include the region fixed effects, and the one of tertiary education, in the specification that control for regional unobservables, turn out to be significant from a statistical point of view.

The results obtained in the regression analysis for the other indicator of support, the percentage of the region's population that believed that membership of the EU is beneficial for the country, are summarized in Table 4.2. In this case, based on the simple regressions, it can be said that the effect of the intensity of the Cohesion Policy in the region is positive. A 1% increase in Structural Funds expenditures per capita may lead to a rise of 1.5 p.p. in the indicator of benefits from EU membership. A difference with respect to the previous indicator of support is that none of the socio-economic measures correlates with the one analysed now. Coefficients of GDP per capita, tertiary education, and employment rate are positive but not statistically different from zero. By contrast, the coefficients of the poverty variables are negative, though also non-significant. As to the measures of the territorial and institutional context, there seems to be a positive and significant association between population density and the percentage of the population that believed that the country benefits from being part of the EU, whereas there seems to be no relationship in this case with the quality of the institutional framework in the region. Lastly, there is a significant (at 5%) positive correlation between the share of employment in the primary sector and the indicator based on the benefits of belonging to the EU.

Table 4.1. EU membership as a good thing and socio-economic regional characteristics.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)
SF pc (log)	-0.0159** (0.0070)									0.0015 (0.0078)	0.0070 (0.0218)
GDP pc (log)		0.0773*** (0.0224)								0.0279 (0.0310)	0.1347 (0.1185)
Tertiary educ			0.0034*** (0.0010)							0.0015 (0.0010)	-0.0068** (0.0028)
Employment rate				0.0017 (0.0013)						0.0002 (0.0013)	0.0068** (0.0028)
Pop. density (log)					0.0354*** (0.0080)					0.0260*** (0.0077)	0.3400 (0.2579)
EQI						0.0358*** (0.0121)					
Poverty risk							0.0003 (0.0016)				
Poverty – Social excl.								0.0006 (0.0012)			
Agric. employment									0.0006 (0.0010)		
Region FE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	464	460	464	463	450	148	120	120	171	431	431
R-squared	0.0191	0.0431	0.0407	0.0086	0.0746	0.0556	0.0782	0.0803	0.0010	0.0852	0.0972

Notes: Clustered (by region) standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported in column (xi).

Table 4.2. Benefit from EU membership and socio-economic regional characteristics.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)
SF pc (log)	0.0152** (0.0069)									0.0387*** (0.0076)	0.0153 (0.0191)
GDP pc (log)		0.0205 (0.0224)								0.0496* (0.0300)	0.2382** (0.1089)
Tertiary educ			0.0015 (0.0010)							0.0009 (0.0010)	-0.0058** (0.0028)
Employment rate				0.0002 (0.0012)						0.0014 (0.0012)	0.0075*** (0.0026)
Pop. density (log)					0.0205*** (0.0075)					0.0228*** (0.0076)	0.4685* (0.2444)
EQI						0.0170 (0.0122)					
Poverty risk							-0.0025 (0.0016)				
Poverty – Social excl.								-0.0016 (0.0012)			
Agric. employment									0.0034** (0.0014)		
Region FE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	464	460	464	463	450	148	120	120	171	431	431
R-squared	0.0629	0.0536	0.0596	0.0508	0.0950	0.0121	0.0822	0.0750	0.0279	0.1473	0.1905

Notes: Clustered (by region) standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported in column (xi).

The estimated effect of the Structural Funds expenditures remains positive after controlling for the observed elements of the regional context (column x). In fact, it turns out to be more significant and of greater magnitude than when estimated in the simple regression (column i). This estimate suggests that the gap in support between a region receiving 10% more EU funds per capita than an otherwise similar region (at least in terms of their GDP per capita, percentage of population with tertiary education, employment rate, and population density) is about 39 p.p. It can also be observed that the coefficients of the level of income per capita and population density are positive, although only marginally significant in the case of the former variable.

However, these results can be put into question considering the estimates that control for regional unobservables, i.e. that include region fixed effects. The coefficient for the intensity of the Cohesion Policy in column (xi) is similar in magnitude to the one in column (i) but becomes non-significant due to the large standard error. The essential difference between the specifications that include and do not include the region fixed effects is that the former only exploits the time variation in the data (i.e. disregards the variation across regions). This makes an important difference in a variable such as the Structural Funds expenditures that tend to be quite stable over the period analysed, while it varies substantially across regions.

Therefore, being cautious, the only thing we can conclude is that the variation in the indicator of perception not explained by the determinants of the regional context correlates with the regional variation in the intensity of the Cohesion Policy. But this correlation could be due to other factors in the region (that we do not account for) that affect the perception of the EU and correlate with the amount of Structural Funds.²⁸ In any case, after controlling for the region fixed effects, there seems to be a significant positive effect of the economic situation of the region and population density. Surprisingly, the net effect of increasing the percentage of tertiary education in a representative European region is negative. A fair interpretation of these results is that the worsening in the economic situation of the region (proxied by the change in income per capita and the employment prospect) affected negatively the share of people in the region that believed that the country benefits from being member of the EU. This is consistent with the evolution of this indicator over the period analysed (as described in Chapter 3). In addition, the faster increase in higher education in regions with low initial levels

²⁸ There may also be differences between the short- and long-run effects. In principle, the specification based on the within variation (which includes the region fixed effects) provides an estimate closer to the short-run response.

(convergence in education) and the fact that most of them are less developed regions, suggests that the increase in the percentage of highly educated people in those regions led, at least temporarily, to less support for the EU. By contrast, variations in the amount of Structural Funds spent in the region would not have had a significant effect in the changes observed in the indicator.

There are also some important differences in the estimated effect of the Structural Funds expenditures on the two indicators of the attitudes towards the EU. The estimated coefficients in the simple regressions reported in column (i) of Tables 4.3 and 4.4 suggest that the raw correlation between the intensity of the policy and trust in the EU on the one hand, and having an optimistic image of the EU on the other hand, is positive and statistically significant. However, the effect of the Structural Funds remains significant and sizeable when the regional observed controls are added only in the case of the measure of trust. As in the case of the indicators of support for the EU, the effect on trust becomes insignificant after including the region fixed effects. Therefore, similar arguments as regards the variation over time and across regions apply in this case: regions with higher levels of Structural Funds per capita display higher trust in the EU, but increasing the funds in these regions does not seem to rise further their trust in the Union.

Some differences between the trust and image indicators are observed as well in their correlations with the measures of the regional context. The estimated raw effects are significantly negative for the GDP per capita and employment rate in both indicators. A negative correlation is also estimated for tertiary education, although it is only significant in the case of the positive image of the EU. Overall, these results suggest that positive attitudes towards the EU are more frequent among the populations of the less developed regions, perhaps by contrast with the perception that they have of the national and regional bodies.

In general, there is no correlation between the indicators of attitudes and the measures of poverty in the region. The only exception is the positive association between the proportion of population at risk of social exclusion and having a positive image of the EU. As argued in the case of the negative correlation with income per capita and the employment rate, this could be due to the fact that those individuals do not hold the EU responsible for their situation. In addition, the lack of a significant correlation with the measure of poverty risk suggests that the EU may be evoking a more positive image among those above the risk-of-poverty threshold but severely materially deprived or living in households with very low work intensity, than for individuals at the very bottom of the income distribution, i.e. below the risk-of-poverty threshold.

Table 4.3. Trust in the EU and socio-economic regional characteristics.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)
SF pc (log)	0.0185*** (0.0055)									0.0206*** (0.0065)	0.0304 (0.0191)
GDP pc (log)		-0.0347** (0.0171)								-0.0001 (0.0262)	0.2954*** (0.1000)
Tertiary educ.			-0.0011 (0.0009)							-0.0012 (0.0009)	-0.0005 (0.0030)
Employment rate				-0.0022** (0.0010)						0.0001 (0.0011)	0.0016 (0.0022)
Pop. density (log)					0.0079 (0.0064)					0.0186*** (0.0062)	0.2044 (0.2309)
EQI						-0.0263** (0.0121)					
Poverty risk							-0.0010 (0.0016)				
Poverty – Social excl.								0.0008 (0.0012)			
Agric. employment									0.0053*** (0.0009)		
Region FE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	464	460	464	463	450	148	120	120	171	431	431
R-squared	0.2636	0.2448	0.2449	0.2527	0.2309	0.0474	0.3929	0.3932	0.1033	0.2684	0.5640

Notes: Clustered (by region) standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported in column (xi).

Table 4.4. Positive image of the EU and socio-economic regional characteristics.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)
SF pc (log)	0.0149*** (0.0053)									0.0087 (0.0069)	0.0306 (0.0207)
GDP pc (log)		-0.0390** (0.0185)								0.0063 (0.0271)	0.2321** (0.1053)
Tertiary educ			-0.0018** (0.0008)							-0.0011 (0.0009)	0.0037 (0.0024)
Employment rate				-0.0042*** (0.0008)						-0.0033*** (0.0011)	0.0048** (0.0022)
Pop. density (log)					0.0109* (0.0063)					0.0171*** (0.0060)	0.0779 (0.2216)
EQI						-0.0379*** (0.0102)					
Poverty risk							0.0012 (0.0015)				
Poverty – Social excl.								0.0024** (0.0011)			
Agric. employment									0.0065*** (0.0008)		
Region FE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	464	460	464	463	450	148	120	120	171	431	431
R-squared	0.1511	0.1422	0.1500	0.1937	0.1384	0.0995	0.3355	0.3715	0.1763	0.1986	0.4262

Notes: Clustered (by region) standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported in column (xi).

The association between population density and the index of institutional quality is similar for the two indicators analysed in Tables 4.3 and 4.4. Trust in the EU and the image it evokes do not seem to vary with population density. Conversely, they could be affected negatively by the quality of regional institutions. As in the case of economic indicators, there may be a sort of substitution effect by which individuals living in regions with poor institutional frameworks perceive more positively the EU than those with better local governments.

Finally, the results indicate that the share of agricultural employment is positively associated with trust in, and an optimistic image of, the EU. Again, as long as this is a good proxy for the amount of EU funds allocated to the region by the Common Agricultural Policy, it could be concluded that it contributes to increasing trust in the EU and improving the image that it evokes in the citizens of the regions that benefit most from this policy.

As to the results from the specifications that include simultaneously the variables available for the three sub-periods (columns x and xi), it is observed that the effect of the Structural Funds on the attitudes indicators is always positive, although only statistically significant in the case of trust when controlling for the observed regional context, but not for region fixed effects. It is worth noting that the size of the estimated effect of the Structural Funds expenditures per capita in the region is greater in the specification that controls for regional unobservables (column xi in Tables 4.3 and 4.4) than in the one that only accounts for the observed measures of the regional context. The insignificance of the effect seems to be due to an increase in the standard error of the estimated coefficient, what results in a less precise estimation of the parameter. In this regard, the low variability 'within' (changes over the periods) compared to the variability 'between' (differences across regions) in the amount of EU funds spent in the regions could be making it difficult to identify the effect.²⁹

Therefore, although we must be cautious and avoid deriving causal implications from these results, we do believe that it is possible to conclude that there is a certain positive relationship between the funds spent in the regions and their long-run degree of trust in the EU. However, it can be said that the amount of EU funds spent in the region have no significant effect on the changes experienced by trust in the EU over the period analysed (see section 3.4). Interestingly, they were

²⁹ The changes in the significance and even in the sign of the coefficients estimated for the controls of the regional context are also noteworthy. This suggests that their contribution to explain the differences between regions (between variability) in trust and in the image of the EU could be very different from their role in explaining the changes over the periods analysed (within variability).

affected by the evolution of the economic situation in the region, as deduced by the significant coefficient associated to GDP per capita in column (xi) of Table 4.3. In addition to the level of income, the evolution of employment in the region could have also influenced the change in the image of the EU observed since the outset of the financial and euro crises (column xi in Table 4.4).

Finally, it is worth mentioning that the explanatory power of the intensity of the policy and the different regional magnitudes, as measured by the R^2 , is much higher in the cases of trust and the positive image of the EU than for the indicators of support. In other words, these regional variables account for a reasonable portion of the variability in the case of the former indicators, but only for a reduced fraction in the case of the latter. From the evidence reported in the López-Bazo and Royuela (2017) –PERCEIVE Deliverable 2.2– it can be conjectured that the bulk of the regional variability in the support indicators can be originated by differences in the composition of the regional populations (both in terms of their demographic characteristics and the personal mechanisms that are expected to contribute to the formation of a European identity). The impossibility of controlling for these differences in an aggregate framework can explain the limited explanatory power of the specifications, particularly for the support indicators.

4.4.2. Effect of the efficiency in the deployment of Cohesion Policy funds.

So far, attention has focused on the effect of the intensity of the Cohesion Policy, measured by the total amount of Structural Funds expenditures per year in the region. However, as discussed in Chapter 2, the way of managing and deploying the funds allocated to the region can also matter when it comes to the perception of the Cohesion Policy and, eventually, the citizens' support for the European integration and their attitudes towards the EU. As a consequence, in this section we explore the relationship between the rate of absorption of the Cohesion Policy funds in the region and the four indicators of their citizens' perception of the Union. Besides, under the assumption that the absorption rate could hide important aspect of the efficiency in the use of the funds allocated to the region, we extend the analysis to the two alternative measures mentioned in section 4.3 and described in detail in Chapter 2, namely the percentage of funds spent in the first five years of implementation of the programme, and the number of years needed to accumulate 50% of the amount allocated to the region.

As in the case of the volume of Structural Funds expenditures described in the previous section, this one reports the results from the simple regressions between each measure of efficiency and the four indicators of the citizens' perceptions of the EU. Then, the ones obtained from the specification that adds the amount of

Structural Funds expenditures per capita and the regional controls are discussed.³⁰ To maximize comparability with results in the previous section, the same set of regional controls have been considered in this analysis. Since the measures of efficiency are only available for the programming period 2007–2013, it is not possible to estimate the effects of interest by pooling the data for the three subperiods used in the analyses of the previous sections. Therefore, the regressions in this section exploit only the cross section of regions for the last subperiod, 2014–2016.

Results are summarized in Table 4.5. Columns (i) and (ii) show the ones corresponding to the absorption rate. It can be observed that there is no significant relationship between the indicators of support and attitudes and the ratio between the amounts actually spent and allocated to the region. The only significant coefficient is observed in the simple regression between absorption and the proportion of population that believed that the country benefits from EU membership. However, the relationship vanishes when the regional controls are included.

A different picture is deduced from the results with the alternative measures of efficiency. Those corresponding to the percentage spent in the first five years are reported in columns (iii) and (iv). In this case, results indicate that the greater the percentage of EU funds spent in the region in the first five years of the programming period, the higher the support for the EU among their citizens. This positive relationship is statistically significant (at 5%) and, particularly in the case of the benefit from EU membership, its magnitude does not seem to be affected by the inclusion of the amount of Structural Funds and the controls of the regional context. By contrast, the relationship between the percentage spent in the first five years and the indicators of trust and image of the EU is negative, although not statistically significant.

³⁰ It is worth noting that the inclusion of the amount of Structural Funds as a control aims to capture differences in the efforts required to manage the funds allocated to the region. The other regional controls, particularly per capita GDP, are expected to capture the effect of differences in resources available to manage the EU funds.

Table 4.5. Perception of the EU and efficiency in the management of the EU funds.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
EU membership a good thing						
Absorption rate	0.0230 (0.0185)	-0.0002 (0.0145)				
Percentage in 5 years			0.4391*** (0.1403)	0.2854** (0.1369)		
Years until 50%					-0.0739*** (0.0180)	-0.0643*** (0.0157)
Regional Controls	NO	YES	NO	YES	NO	YES
R-squared	0.0058	0.2297	0.0745	0.2542	0.1080	0.3031
Benefit from EU membership						
Absorption rate	0.0186** (0.0078)	-0.0083 (0.0109)				
Percentage in 5 years			0.3360** (0.1367)	0.3039** (0.1525)		
Years until 50%					-0.0596*** (0.0186)	-0.0601*** (0.0172)
Regional Controls	NO	YES	NO	YES	NO	YES
R-squared	0.0032	0.2377	0.0363	0.2603	0.0586	0.2906
Trust in the EU						
Absorption rate	-0.0025 (0.0090)	-0.0119 (0.0120)				
Percentage in 5 years			-0.1362 (0.1301)	-0.1604 (0.1116)		
Years until 50%					0.0073 (0.0176)	-0.0024 (0.0139)
Regional Controls	NO	YES	NO	YES	NO	YES
R-squared	0.0001	0.2954	0.0102	0.3045	0.0015	0.2935
Positive image of the EU						
Absorption rate	0.0005 (0.0062)	-0.0094 (0.0086)				
Percentage in 5 years			-0.1974* (0.1143)	-0.1573 (0.1150)		
Years until 50%					0.0075 (0.0168)	-0.0056 (0.0136)
Regional Controls	NO	YES	NO	YES	NO	YES
R-squared	0.0000	0.2219	0.0227	0.2317	0.0017	0.2214

Notes: OLS estimates using observations for 143 (140 in columns ii, iv, and vii) regions. Data for the perception of the EU from the period 2014-2016. The indicators of the efficiency in the management of the EU funds are those defined in section 2. Regional controls are the ones used in the multiple regressions in section 4.4.1. Robust standard errors in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The within-R-squared is reported in columns (ii), (iv) and (vi).

The evidence obtained when using the measure of speed in the implementation based on the number of years until 50% of funds allocated were spent is quite similar to the one for the percentage spent in five years. As reported in the last two columns of Table 4.5, support for the EU correlates negatively with the number of years needed to accumulate 50% of the funds allocated to the region. Therefore, inefficiency in the management and deployment of EU funds, reflected in an unbalanced pattern in the temporal distribution of the expenditures, could be leading to less support for the EU in comparison to regions in which management of funds is more efficient. As in the case of the other measure, efficiency does not seem to affect trust in the EU or its image.

Summing up, whereas the results confirm the lack of relationship between the rate of absorption of the Cohesion funds in the region and the citizens' perception of the EU, there could be a connection with the speed at which the EU funds allocated to the region are spent throughout the programming period. This might be due to a more appropriate allocation of resources to solve the problems of the region, leading to a more positive perception of the policy by the region's population. But it can also capture the effect of the quality of local and national governments, and of the entire socio-economic system in the region. Better institutional and socio-economic frameworks are expected to facilitate the allocation of EU funds to profitable projects in due time, whereas institutional deficiencies can hamper the appropriate management of the allocated resources.

4.5. Summary of results.

This section has analysed to what extent territorial disparities in the indicators of the citizens' support and attitudes towards the EU, reported in Chapter 3, can be explained by differences across EU regions in the incidence of the Cohesion Policy. In addition, it has also provided evidence on the relationship between perception of the EU and some of the most important determinants of the regional context. The evidence obtained can be summarized as follows:

- i. Theoretical arguments suggest that regions recipient of Cohesion Policy funds benefit directly or indirectly as long as the EU funds contribute to alleviate the deficits of the local economies. However, the evidence so far is partial and inconclusive. Empirical studies using data aggregated regionally for a large set of member states is particularly scarce.
- ii. The evidence from a large set of EU regions suggests that the intensity of the Cohesion Policy, as measured by the annual total Structural Funds expenditures per capita in the region, correlates negatively with the indicator of support based on the proportion of people that believed that the

membership of the country to the EU is a good thing, and positively with the other indicators. This could be explained by the different relationship between the indicators of EU perception and the economic situation of the region, measured for instance by the level of GDP per capita.

- iii. Differences in the amount of Structural Funds expenditures could explain the variation across regions in the proportion of people that believed that the country benefits from EU membership, and in the proportion of the regional population that trust in the EU. Nevertheless, they do not seem to have a significant contribution when it comes to explaining the changes over time in support and attitudes towards the EU in the sub-periods analysed.
- iv. There is no correlation between the rate of absorption of the Cohesion Policy funds and the indicators of EU support and attitudes. This can be explained by the high absorption rates in all regions at the end of the 2007-2013 programming period and, consequently, the small variability in this measure. More interesting is the evidence as regard the effect of the alternative measures of efficiency in the management and deployment of EU funds. It suggests that an efficient use of the Structural Funds allocated to the region can contribute to improve support and stimulate positive attitudes towards the EU. In the future, further evidence should be obtained that include data from the next programming periods to confirm or refute the pioneering results in this study.
- v. The results confirm a positive association between the measures of the economic situation of the region and the indicators of support. However, the relationship is negative for those proxying for the citizens' attitudes towards the EU. This suggests that when deciding on the benefits of the EU membership, individuals take economic arguments into account. On the contrary, they could be weighting much less the economic situation of the region when deciding attitudes towards the EU. In that case, the social and emotional factors would be more important.
- vi. The economic situation of the region could be contributing to explain the changes in support and, particularly, in attitudes towards the EU over the period analysed. However, its role would much less important to explain differences across regions in these indicators. Conversely, population density seems to be more related to the regional differences in support and attitudes than to the changes observed over the sub-periods in the corresponding indicators. This can be due to the very smooth evolution of population density in the short period of time analysed in this study.

- vii. The evidence does not support a significant association between the proportions of people at risk of poverty and social exclusion, and the indicators of the citizens' perception of the EU. This is against the hypothesis that the higher the proportion of discontented people in the region, the lower the support for the EU integration process.
- viii. The effect of the quality of the regional institutions on support for the EU seems to be different to that on citizens' attitudes. It could be positive for the former, particularly for the percentage of people that believed that EU membership is a good thing, but negative for the latter (trust and a positive image of the EU). By contrast with a complementary effect on EU support, citizens in regions with a poor institutional local framework would tend to trust more the EU, and have a more positive image of it.
- ix. The positive correlation with employment in the primary sector suggests that the impact of the Cohesion Policy on EU support and positive attitudes could be reinforced by the other major EU policy, the Common Agricultural Policy. As in the case of the results for poverty and institutional quality, more analyses should be carried out in the future, including more periods and regions, to verify the accuracy of this result.

5. Regional growth and convergence, Cohesion Policy, and citizens' perception of the EU.

5.1. Introduction.

This chapter contributes to analyse the impact of the Cohesion Policy in the region on its economic growth, and to assess to what extent (if any) growth and convergence towards average per capita income in the EU affected citizens' perception of the EU. The economic impact of the Cohesion Policy has been recently and extensively analysed to understand the role of EU funds allocated at the regional level in improving regions' growth prospects and in reducing regional disparities (Pieńkowski and Berkowitz, 2015; Fratesi and Wishlade, 2017). The results, so far, are not conclusive but vary according to the groups of regions analysed, the programming periods considered, and the methodology used. Interestingly, results for EU regions belonging to the member states that joined the Union in the 2004, 2007 and 2013 enlargements are still scarce. These regions are among the least developed in Europe and consequently have been receiving a large amount of EU funds since their EU accession. Similarly, due to data availability, only a few studies have included information for the most recent completed programming period, i.e. 2007–2013. It can be argued that funds allocated in this programming period could have had a greater impact on growth due to improvements introduced over the past programming periods in the design, planning and management of Cohesion Policy funds, thanks to a learning process in the implementation of the policy (Rodriguez-Pose and Novak, 2013; Pinho et al, 2015). Our study aims to complement the existing analyses by considering a set of regions that includes those in the new EU member states and data on Cohesion Policy funds for the 2007-2013 programming period.

Regarding the second issue, to our knowledge there is no previous study addressing the effect of regional economic growth and, potentially, of the convergence towards the EU average per capita income, on the regional citizens' perception of the EU. Some studies have analysed the impact of economic growth on the support for further European integration and the degree of identification with Europe using individual-level data (e.g. Verhaegen et al, 2014). However, some limitations apply: i) economic growth is measured at the national rather than at the regional level; ii) economic growth is included as a control variable of the economic context; iii) the consequences of economic growth in terms of convergence are not assessed. By contrast, this chapter focuses on the effect of growth experienced by regional economies, considering to what extent (if any) it has contributed to the convergence to the EU average.

Our analysis uses the regional indicators of support for and attitudes towards the EU introduced in chapter 3, and the measure of the intensity of the Cohesion Policy in the region in Chapter 4. Other magnitudes defined in Chapter 4 are also used, and regional values of per capita GDP in different years are combined to compute economic growth over a period of time in each region.

5.2. Cohesion Policy, regional growth and citizens' perception of the EU.

About one third of the EU budget – 346 billion Euros – over the programming period 2007–2013 was allocated to the Cohesion Policy. Similar figures have been assigned to the current programming period, 2014–2020. This makes the Cohesion Policy the most visible and largest instrument of the EU, which is expected to have a significant contribution to growth and employment, particularly in the less advanced regions. Indeed, the Cohesion Policy accounts for a large portion of public investments in Europe, and is considered by the European Commission as a tool to boost sustainable long-term growth and contribute to decrease regional disparities (European Commission, 2013). Hence, it has become one of the fundamental pillars of the EU project.

The goal of the Cohesion Policy is twofold. First, to promote the economic competitiveness of the EU regions and, thus, their growth prospects. Second, to reduce regional disparities with regard to the level of development and the backwardness of the less-favoured regions (e.g. Pieńkowski and Berkowitz, 2015; Fiaschi et al, 2018). The Cohesion Policy aims to achieve these objectives by fostering structural changes in regional economies through investments widely recognized as engines of long-run growth (infrastructures, human capital, and technological capital). Therefore, the Cohesion Policy interventions are expected to have a short-term impact on regional economies through the implementation of the investment programmes, and a long-term effect as a result of the induced changes in the economic fundamentals of the regions. In other words, interventions of the Cohesion Policy are intended to help create conditions that esteem growth by improving the economic structure, particularly in the less favoured regions.

Nevertheless, the implementation of the Cohesion Policy has attracted criticism as well. Pieńkowski and Berkowitz, (2015) grouped them in the following categories:

- Interventions of the Cohesion Policy can be unnecessary or even distortive. Under the neoclassical growth assumptions, aid to lagging-behind regions via investments would be unnecessary because there are already mechanisms that will, eventually, lead economies to their long-run paths. EU funds could

hinder these mechanisms by contributing to the misallocation of production factors.

- The Cohesion Policy could be inefficient if it counteracts the trend of production factors to move to the core economies where returns are higher, at the expenses of regions in the periphery. According to the New Economic Geography, these movements are encouraged by economic integration. Therefore, there may be a trade-off between maximization of total growth in the EU, which could be reinforced by concentrating efforts in core regions, and allocating resources in the less developed areas, which will work against agglomeration forces.
- Expectations about the positive impact of the Cohesion Policy on the regional economies in Europe could be misleading due to the lack of effectiveness of the policy (e.g. difficulties in identifying priorities, problems in the management of funds, dispersion of objectives, etc.).
- There might be unexpected effects, particularly in the case of some policy interventions. For instance, investments in infrastructures that decrease transport costs may lead to further concentration of economic activity in core regions at the expense of less developed peripheral regions.

Therefore, the nature of the impact of the intensity of the Cohesion Policy on regional economic growth has become a focus for empirical studies. Indeed, the effectiveness of EU funds to promote growth and reduce disparities between and within member states has attracted academics and policy-makers' attention, and has stimulated a fertile literature since the implementation of the EU regional policy. However, its results are far from conclusive, which is not surprising due to the many difficulties that the studies faced when estimating the impact of the Cohesion Policy on regional growth. Main limitations are represented by i) data availability and accountability with regard to the amount of EU funds absorbed in each region and the appropriate geographical scale of the analysis³¹, and ii) the particular characteristics of the Cohesion Policy and the framework in which is implemented. In particular, it has been highlighted that (Fratesi and Wishlade, 2017; Fiaschi et al, 2018):

- Interventions have diverse social and economic objectives, which could impact economic growth in different ways, with distinct intensities, and over different

³¹ Eligibility and allocation of funds is decided at the NUTS 2 level, but this might not be the appropriate geographical level to capture the effects of the policy.

periods of time. As long as the regions differ in terms of the 'basket' of objectives, the growth impact of a similar amount of funds in a given period of time may vary between regions.

- The main aim of some EU funds is not the direct stimulus of regional productivity, but income support to specific areas and population groups. As a consequence, their impact on overall economic growth can be ambiguous or even negative.
- The Cohesion Policy coexists with other EU policies that tend to favour advanced regions. In addition, there may be overlapping effects of national and local policies that can reinforce or counteract the impact of the Cohesion Policy.
- Regions within the same eligibility group qualify for quite different amounts of funds. For example, the intensity of the policy in the region vary largely between the group of 'less developed' regions.
- The Cohesion Policy has been fine-tuned and improved over the different programming periods, for instance concentrating resources in fewer objectives and geographical areas. The promotion of competitiveness, innovation, job creation, and education and training have gained momentum in the most recent programming periods at the expense of hard investments (infrastructures). Changes have also been introduced in the elaboration and management of the specific programmes, with increasing involvement of institutional agents and managing authorities, and paying greater attention to monitoring and evaluation of interventions. These 'learning' processes may have made the impact of the Cohesion Policy on growth more intense in the more recent programming periods compared to the initial ones.
- There may be spatial externalities in the economic growth effect of the policy. On the one hand, investments in a region in some types of capital are expected to have a direct impact in other regions due to the network characteristics of these assets (e.g. transport and communication infrastructures). On the other hand, economic growth induced by EU funds can benefit other regions to which the beneficiary region is connected (e.g. through trade flows). In principle, even the most developed regions could have benefited from the EU funds invested in the backward regions, which makes it difficult to identify the effect of the policy on growth.
- The Cohesion Policy is managed through a multi-level governance model, with the participation of national, regional and local bodies. Therefore, the quality of the specific institutional framework, for example in terms of bureaucratic

effectiveness and corruption, can affect the effectiveness of the use of EU funds in the region and, consequently, its impact on economic growth.

Further, Pieńkowski and Berkowitz, (2015) point out that empirical studies estimating the effect of the Cohesion Policy on economic growth face an additional difficulty, i.e. the identification of the specific impact of the policy due to the overlapping influence of other factors linked to economic growth. In particular, the amount of funds allocated to a region is decided based on the past levels of income per capita. These, in turn, are expected to be positively correlated with the current growth level in the region, through the so-called catch-up mechanism. Similarly, as mentioned above, the institutional quality in the region can affect the way in which EU funds stimulate growth and, have a direct impact on regional growth (Rodríguez-Pose and Garcilazo, 2015).

The comparison of the results of the different studies is also far from being straightforward, because they are heterogeneous in several respects, including the magnitude used to measure the policy, the sample of regions and countries included in the study, the time period analysed, and the estimation strategy (Pinho et al, 2015). Most studies estimate the effect of the Cohesion Policy on regional growth from a specification in which the dependent variable is the growth of GDP per capita (or less frequently per worker) and the regressors include the variable representing the policy (amount of EU funds in relation to the size of the region or a dummy identifying the regions receiving funds), initial level of GDP per capita, and a number of other growth enhancing factors (that differ widely between studies). As regards the measurement of the policy, Pieńkowski and Berkowitz, (2015) stresses the importance of the quality of the data on the Structural Funds used in the analysis. For instance, actual payments rather than allocations should be used due to differences in absorption rates between countries and regions and the variability in the temporal profiles of the amounts effectively spent within a programming period (see Chapter 2). Above all, they suggest avoiding the use of a dummy, since the intensity of the policy varies widely among the regions receiving EU funds, and the effect is expected to increase (at least up to a certain point) with intensity.

The sources of variation in the estimated impact of the Cohesion Policy, as measured by the effect of the Structural Funds expenditures on growth of income per capita, has been studied in Dall'Erba and Fang (2017). Based on the results of a meta-regression analysis of 323 estimates of the effect of the Cohesion Policy in 17 manuscripts written in English and published from 1996 to 2013, they conclude that a higher impact of the policy is obtained by studies that use a sample smaller

than the EU 12, focus on regions eligible as ‘Objective 1’, and on most recent programming periods (supporting the ‘learning effect’). They also observe some differences between estimates that control and do not control for the endogeneity of the Cohesion Policy variable, and between those that include measures of human capital, R&D, and institutional quality, as regressors.

These differences in the design of the empirical analyses and in the groups of regions and periods considered, in addition to the technical issues and the particularities of the Cohesion Policy and its implementation mentioned above, can explain the variety of conclusions in the extant literature. They can be summarised as follows:³²

- Most studies based on the regression analysis conclude in favour of a positive moderate effect of Structural Funds on growth (Cappelen et al, 2003; Puigcerver-Peñalver, 2007; Rodríguez-Pose and Garcilazo, 2015), particularly for regions that benefit most from the policy, i.e. the less developed in the EU (Esposti and Busoletti, 2008; Moll and Hagen, 2010; Fiaschi et al, 2011), and in the most recent programming periods (Fiaschi et al, 2018).
- The effect vary between countries and regions (Le Gallo et al, 2011; Esposti and Busoletti, 2008). Indeed, some studies have emphasised the role of ‘conditioning factors’ that explain where, when and how policy is effective (Rodríguez-Pose and Fratesi, 2004; Ederveen et al, 2006; Dall’Erba and Le Gallo, 2007; Rodríguez-Pose and Novak, 2013; Fratesi and Perucca, 2014; Rodríguez-Pose and Garcilazo, 2015; Pinho et al, 2015).
- There is a non-negligible group of estimates that questions the efficacy of the EU funds, and some even suggest negative effects (Fagerberg and Verspagen, 1996; Ederveen et al, 2006; Dall’Erba and Le Gallo, 2008; Bouayad-Agha et al, 2011). But it is important to note that their results only use data from the earliest programming periods.

It is also noteworthy that a number of recent studies has used alternative methods to estimate the causal effect of Cohesion Policy (e.g. Regression Discontinuity Design). In general, their results confirm the small positive effect of policy interventions on regional growth and the heterogeneity of the impact, depending on specific characteristics of the recipient regions and on the amount of funds (Becker, 2010; Pellegrini et al, 2013; Becker et al, 2012 and 2013; Percoco, 2017;

³² For more details about empirical studies providing estimates of the impact of the Cohesion Policy on regional growth see e.g. Pinho et al (2015), Pieńkowski and Berkowitz (2015), and Fratesi and Wishlade (2017).

Gagliardi and Percoco, 2017). In any case, the evidence in Di Cataldo (2017) and Becker et al (2018) suggests that the effect of EU funds would be only temporary, not affecting the long-run pattern of the regional economy. Eligibility as ‘Objective 1’ / ‘Less developed’ region has immediate effects that, however, vanish as soon as this status is lost.

Summing up, there seems to be enough evidence that supports a positive, although perhaps moderate and short-term, impact of the Cohesion Policy on the growth prospects of the European regions. The effect could be increasing in the EU funds expenditures in the region, at least up to a certain amount, and more intense in the most recent programming periods. Since the intensity of the policy, in terms of the relative amount of EU funds allocated, is much higher in the less developed regions, we can infer that it has contributed to decrease regional disparities in income per capita.³³

At this point, the question that arises is whether, and to what extent, the growth induced by the interventions of the Cohesion Policy influences the perception that citizens have of the Union. In particular, if convergence to the EU income standards of the less developed regions contributes to increase the support of their citizens to the European project and favours positive attitudes towards the EU. As long as the Cohesion Policy effectively stimulates investments in education, upgrade of skills and, through different mechanisms, increases the income level of broad sectors of regional populations, the growth that it induces could be transmitted to greater support for integration and better attitudes towards the EU.

To our knowledge, this has not been studied yet in the literature. In fact, there is no evidence of the effect of the economic growth experienced by the region (or country) on the citizens’ perception of the EU from a macro perspective, i.e. using aggregate data.

Our analysis is grounded on the economic utilitarian arguments of support for European integration (Gabel and Palmer, 1995; Gabel, 1998) and the evidence about the effect of growth using individual data on the perceptions of the EU. The utilitarian model of public support for European integration states that citizens’ support for integration depends on their welfare gains. More precisely, individual support for integration is expected to depend positively on the level of education, skills, and income of individuals. There is wide empirical evidence supporting the impact of utilitarian considerations on support for European integration and even on the development of a European identity (e.g. Verhaegen et al, 2014). Even

³³ This is consistent with the conclusions about the effect of the Structural Funds on regional disparities in Kyriacou and Roca-Sagalés (2012).

studies (Hooghe and Marks, 2005) that claim that economic calculus is less influential than communal identity, obtain a highly significant effect of the individual characteristics that classify citizens as potential winners and losers of integration. From a complementary perspective, the evidence also points to more support among individuals that have positive expectations of their personal economic prospects relative to those with low expectations (Chalmers and Dellmuth, 2015).

As for the impact of economic growth, a number of studies have included GDP growth in the list of aggregate controls in individual-level specifications. The results in Hartevelde et al (2013) point to a negative effect of growth of national GDP, as an objective indicator of national performance, on trust in the EU in the onset of the financial crisis (2009). Their results are confirmed by Serricchio et al (2013). This study estimates a significant negative effect of GDP growth on Euroscepticism or, in other words, a positive effect on EU support for 2007. But this effect vanished in 2010, once European economies were hit by the crisis. An insignificant effect of economic growth on support for and trust in the EU is obtained by Armingeon and Ceka (2014) for the period 2007–2011. By contrast, using data for 2011, Verhaegen et al (2014) obtained a significant positive effect for GDP growth on support for European integration and a mild effect for European identity. In any case, it is worth noting that none of these studies accounted for the growth experienced by each regional economy, but only for that in the national economy. This may be an important drawback if growth is not uniformly distributed within countries.

Complementarily, some studies have considered the effect of the perceived economic situation of the country, as a subjective economic indicator. For example, Verhaegen et al (2014) and Chalmers and Dellmuth (2015) find that a positive perception of the national economy significantly raises support for European integration and fosters European identity. Likewise, results in Armingeon and Ceka (2014) point to a significant relationship between the perception of the national economy and trust in the EU, in their analysis of the effect of the Great Recession on the loss of trust in the EU.

5.3. Dataset and variables.

The analysis of the effect of the intensity of the Cohesion Policy on regional growth uses a series of economic measures in the set of EU regions for the period 2000 to 2014. The source of data for this analysis is the PERCEIVE regional database already presented in section 4.3. The outcome variable in the analysis is the annual growth rate of GDP per capita in purchasing power standards, whereas the measure used to proxy for the intensity of the Cohesion Policy in the region is the total Structural Funds expenditures per capita. The growth equation specified to

estimate the effect of the policy includes a series of economic magnitudes as control variables, defined as follows:

- Primary education: Percentage of the region's population 25-64 years old whose highest level of education successfully completed is 'Less than primary, primary and low secondary education' (ISCED levels 0–2).
- Tertiary education: Percentage of the region's population 25-64 years old whose highest level of education successfully completed is 'Tertiary education' (ISCED levels 5–8).
- Motorways: Kilometres of the regional motorways network per inhabitant, as an indicator of transport infrastructures.
- Employment rate: Ratio between the employed and the working age population (15 to 64 years old) in the region.
- Employment density: Number of employees per square kilometre.
- Population density: Population per square kilometre.
- Country growth: annual per capita GDP growth rate of the country to which the region belongs.

The average number of European regions included in the sample used to estimate the growth equations in section 5.4 ranges from 140 to 178, depending on the specific set of variables included as controls. In this sense, it is important to bear in mind that the infrastructure indicator is not available for a large group of regions for several years. Also, the lower regional coverage for the early 2000s is due to the lack of data for the newer member states before their accession to the EU.

Unlike most of the previous results, our analysis of the growth effect of the Cohesion Policy includes data from the last programming period (2007–2013) and regions from the member states that joined the Union in 2004 and later.

Regarding the analysis of the impact of regional growth and convergence on the perception of the EU, we use the four indicators of support for and attitudes towards the Union, as from section 3.2. The regional data for these indicators is merged with information about the growth of regional GDP per capita, the Structural Funds expenditures per capita, and a subset of the economic controls described above. Given that growth is computed for the five-year period just prior to the moment in which the perception indicators were measured, the analysis is carried out using the information for the last two subperiods defined in section 3.2. This means that the estimates of the effect of regional growth and convergence on the perceptions of the EU are obtained using the data of support and attitudes indicators for 2007–2009 and 2014–2016, and the rates of GDP per

capita growth between 2002-2007 and 2009-2014. On average, about 170 regions are included in the sample in each period.

Three alternative variables are used to proxy for the effect of regional growth and convergence. The first is a direct indicator of the growth experienced by GDP per capita in the region over a period of five years before citizens' perceptions were measured. This helps to assess if economic growth positively affects support and optimistic attitudes towards the EU. The second aims to capture the convergence towards the EU average of per capita GDP in the region. It is defined as the change over the previous five years in the deviation between the region's GDP per capita and the average level in the EU. The two measures are interacted with a dummy variable that identifies regions with GDP per capita below the EU average. Finally, a set of dummies is defined to take into account that there may be convergence to the EU average from above (when a region with a level of GDP above the EU average converges to the average during the five-year period) or from below (when a region converges to the EU average starting below it), and also divergence from above and from below.

5.4. Results.

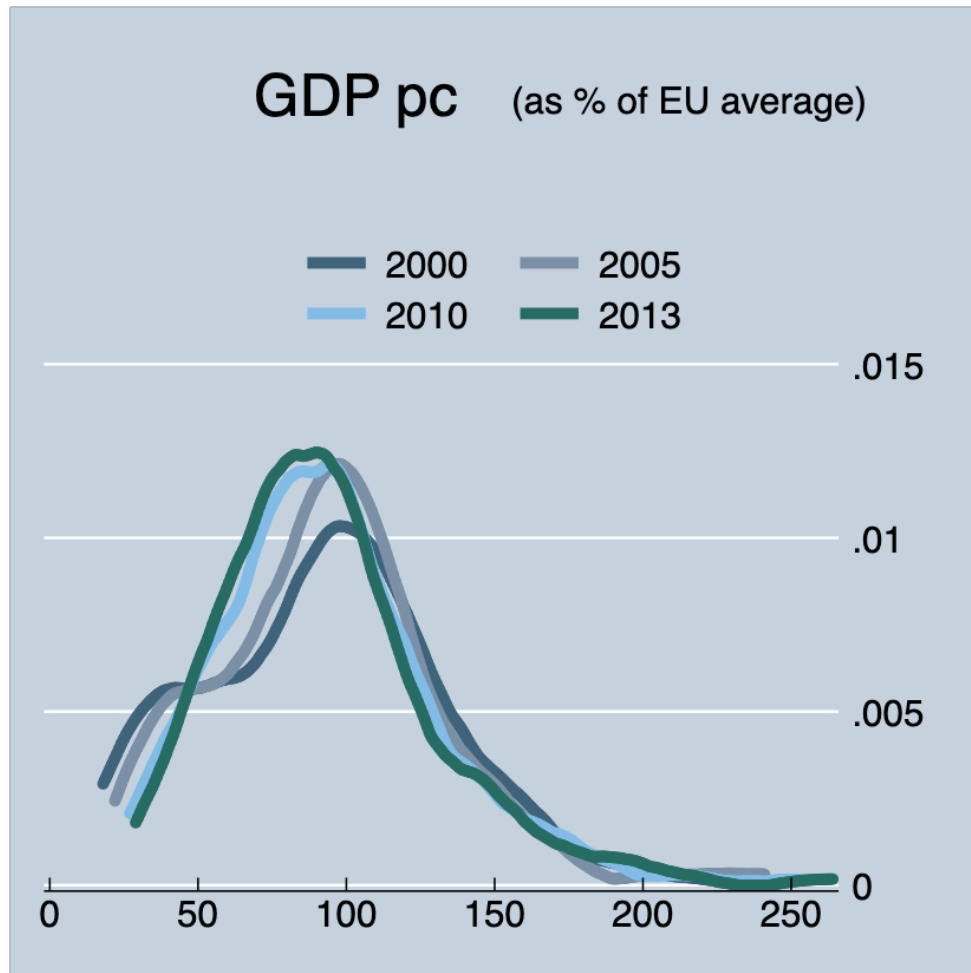
This section presents and discusses the results of the effect of the intensity of the Cohesion Policy on regional growth, and the impact of growth and convergence on citizens' perception of the EU. To frame the study, section 5.4.1 describes the evolution of the regional distribution of GDP per capita during the period analysed. Then, the results of the impact of the EU funds on regional growth are discussed in section 5.4.2. Finally, section 5.4.3 shows evidence regarding the estimated effect of regional growth on the perception of the EU.

5.4.1. Growth dynamics in the EU regions.

Figure 5.1 displays the estimated densities of the level of GDP per capita in the set of European regions used in the analysis. It does so for 2000, 2005, 2010 and 2013. The selection of the last year was conditioned to the availability of data on the Structural Fund expenditures in the PERCEIVE regional database, although similar results were obtained for the regional distribution of GDP per capita in 2014 (last year used to compute the rates of growth). To facilitate the interpretation of the results, the regional values for each year have been calculated as a percentage of the EU average. The comparison of the densities for the different years allows to assess the evolution of regional disparities in income per capita throughout the period analysed. A sort of polarisation in two groups is observed in the distribution of 2000. In addition to the mass of probability concentrated at about the EU average, a significant group of regions showed values below the 50% of the EU

average that year. Further concentration in values close to the EU average, or slightly below it, is observed in 2005. There is also a moderate shift to the right (higher relative values of GDP per capita) of the group of regions with the lowest values. Both phenomena are consistent with a trend towards convergence, that is, a reduction of regional disparities, in the first half of the 2000s. The trend seems to have continued in the second half, particularly because of the improvement experienced by the less developed regions. As can be seen, the polarisation of the distribution observed for 2000 and 2005 vanished in 2010. As a result, the mode of the GDP per capita distribution decreased somewhat to values about three quarters of the EU average. This is consistent with a long right tail in the distribution, corresponding to a numerous group of regions with levels of GDP per capita well above the average. Finally, there seems to be no significant changes in the distribution between 2010 and 2013, despite the turbulences provoked by the Great Recession.

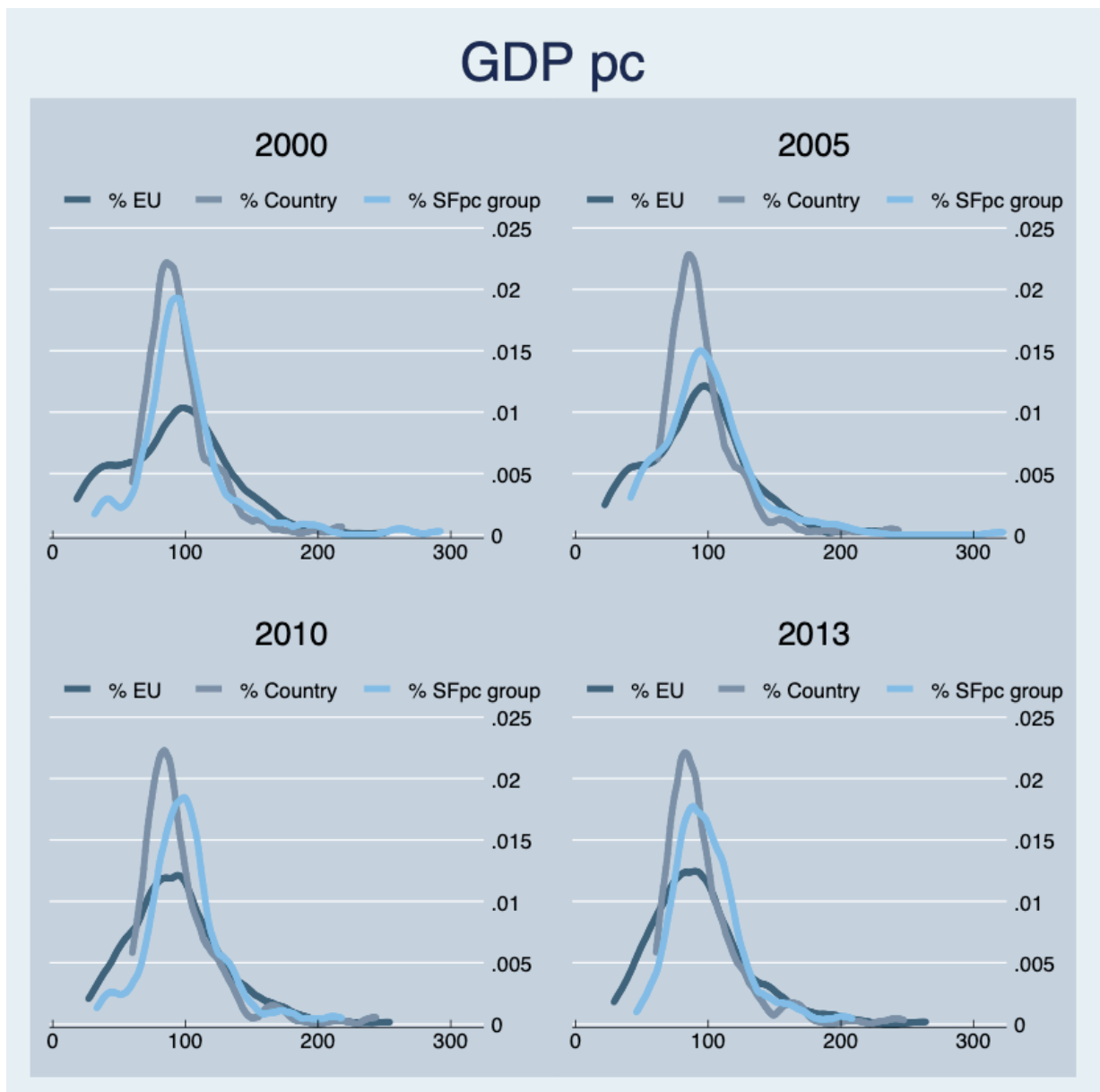
Figure 5.1. Evolution of the regional distribution of GDP per capita.



Note: Density functions estimated by the kernel method using the GDP per capita of each region relative to the EU average level in the corresponding year.

The results in Figure 5.1 are based on the distributions of the level of GDP per capita relative to the average in the EU. To explore further the characteristics of the regional distribution of income per capita, Figure 5.2 shows also the densities obtained when the regional levels are computed as regard the average in the corresponding country, and in the group of regions with similar intensity of the Cohesion Policy. In the latter case, the groups are created based on the quartiles of the regional distribution of the total Structural Funds expenditures per capita.

Figure 5.2. Comparison of the regional distribution of GDP per capita.



Note: GDP per capita in relation to the EU average (%EU), the country average (% Country), and the average in the group of regions that received similar amounts of Structural Funds per capita (% SFpc group).

The results confirm that most of the disparities are due to the differences between countries, since the distribution of GDP per capita in the region in relation to the country average is much more concentrated than that of the deviations from the EU average. Still, differences between countries fail to explain all disparities, suggesting that specific regional factors may be playing an important role. Similarly, the amount of dispersion in the regional distribution of GDP per capita diminishes when it is conditioned to the average of the group of regions with a similar intensity of the Cohesion Policy. This is not surprising, given that EU funds are allocated based on past levels of GDP per capita in the regions, which is a magnitude that shows a high persistence over time. In any case, the most important result is that the disparities seem to be more pronounced when conditioning to the average of the groups based on the intensity of the policy than to the country average. Changes over time in the distribution are also more obvious in this case.

5.4.2. The impact of Cohesion Policy on regional growth.

A growth equation is specified to estimate the impact of the intensity of the Cohesion Policy on the economic growth of the European regions between 2000 and 2014. For this purpose, we follow the contributions in the previous literature, reviewed in section 5.2, and specify the following empirical model:

$$g_{GDP\ pc\ it} = \alpha_i + \delta_t + \beta \cdot SF\ pc_{it-1} + \tau \cdot GDP\ pc_{it-1} + Z_{it-1}\gamma + \varepsilon_{it} \quad (5.1)$$

where $g_{GDP\ pc}$ is the annual (logarithmic) growth of GDP per capita and $SF\ pc$ denotes total Structural Funds expenditures per capita in the region. Subscripts i and t refer to regions and years, respectively. In addition to the GDP per capita in $t-1$, the conditional version of the growth equation includes a series of controls in Z . Following Rodríguez-Pose and Garcilazo (2015), we have considered control variables for the level of education (share of population with primary and tertiary education), transport infrastructures, employment rate, density of employment and population, and the country's rate of per capita GDP growth. The specification also includes year dummies to account for shocks that are common to all regions (δ_t), and region fixed effects (α_i). They capture the effect of specific regional determinants of the level of technology that could be correlated with the measure of the intensity of the policy and, therefore, avoid confounding the estimation of the effect of the Cohesion Policy.

We are mostly interested in two specific estimates:

- β , which captures the change in percentage points in the annual growth rate induced by a 1% increase in the Structural Funds expenditures per capita in the region;
- τ , i.e. the coefficient associated with the rate of convergence. A negative value is expected for this parameter in a scenario of decreasing returns to factors' accumulation in the region and/or technological catch-up.

It has been noted that the estimation of the coefficients in equation (5.1) entails some difficulties, due to its dynamic nature and the inclusion of region fixed effects (Bond et al, 2001). In addition, there may be issues related to the endogeneity of the measure of the intensity of the policy. GMM estimators for dynamic panel data have been applied to growth equations similar to that in equation (5.1), using lagged values of the levels and differences of the variables as instruments. However, the results tend to vary widely depending on the number of lags used to build the instruments. Despite having tested this alternative estimators, we prefer to discuss the results obtained using the traditional fixed effects estimator.³⁴ Results applying a system-GMM estimator for some specifications are reported in Table A5.1 of the Appendix.

In a first stage, the growth equation is estimated without including the observed (Z) and unobserved (α_i) regional controls. Thus, it can be considered as an absolute convergence equation, which is only affected by the Structural Funds payments. Results are summarised in Table 5.1. Columns (i) and (ii) suggest that EU Structural Funds have no effect on growth once the convergence mechanism, which is significant, is considered. However, these results do not take into account that there may be differences in the impact depending on the intensity of the policy. To explore this possibility, the equation is estimated with an interaction term that distinguishes between regions above and below the median of the regional distribution of the Structural Funds expenditures per capita (column iii). It can be observed that the association of EU funds with growth is negative for all regions but only statistically significant for the group in which the intensity of the policy is low. In a similar vein, the results in column (iv) correspond to the specification that includes the interaction between the Structural Funds payments and the initial GDP per capita. The individual coefficients of both variables are positive and statistically significant, but that of the interaction term is negative. This leads to an average marginal effect in the sample of regions that is significantly negative for the initial level of income and negligible in the case of the policy variable. But what

³⁴ Our hope is that the bias of the fixed effects estimator is not very important given the relatively high number of time periods used in the estimation of equation (5.1).

is more interesting is that the association of the Structural Fund payments per capita with growth seems to decrease with the level of development.

The results based on the simple version of the growth equation point to a differentiated effect of the Structural Funds expenditures depending on the intensity of the policy and the level of development. However, this conclusion could be misleading if the omission of other regional characteristics were biasing the estimation of the effect of interest. The estimation of the extended version of the growth equation seeks to overcome this drawback. The results are reported in Table 5.2. The specifications differ in terms of the set of regional controls (columns i to iv) and the consideration of the interaction terms already discussed for the simple version of the growth equation (columns v and vi). It is observed that regardless of the inclusion or not of the proxy for the infrastructure's endowment (that is not available for several regions in some years), the coefficient of the Structural Funds is positive and statistically significant. This is in sharp contrast with the estimated effect of the policy in Table 5.1. The estimated size of the effect is reduced by half when the growth in the country is added as an additional control in columns (iii) and (iv), although it remains highly statistically significant. Based on these estimates, it can be said that growth increases by 0.5-0.6 percentage points when doubling total Structural Funds expenditures per capita.³⁵ Nevertheless, the results in columns (v) and (vi) suggest that this effect is far from homogeneous.³⁶ Indeed, it seems to be positive only for the group of regions where the intensity of the policy is above the median. Similarly, the estimated positive effect decreases with the level of development of the region, as proxied by its per capita GDP. These results are consistent with previous studies that concluded that the growth effect of EU funds is only significant in 'Objective 1' regions, that is to say, in regions with low levels of income per capita. It is also noteworthy that the coefficient of the convergence mechanism, τ , is significant and negative in all specifications in Table 5.2. Its magnitude is clearly higher than that estimated in the simple specifications in Table 5.1 and, as it is derived from the coefficient of the interaction term in column (vi), it increases with the amount of EU funds.³⁷

³⁵ $\hat{\beta}/100 = \text{Unit } \Delta g_{\text{GDP pc}} / \% \Delta \text{SF pc}$

³⁶ The specifications in columns (v) and (vi) include the transport infrastructures indicator as a regressor. Due to the lack of information for this variable for several regions in some years, the number of observations in the sample decreases somewhat. In any case, the results obtained by excluding this variable are qualitatively similar.

³⁷ However, it should be kept in mind that the fixed effect estimator of the convergence parameter in the dynamic growth model of equation (5.1) is upward biased. In other words, the estimates in Table 5.2 may be overestimating the rate of convergence of the European regions.

Table 5.1. Estimation of the effect of Structural Fund expenditures. Simple model.

	(i)	(ii)	(iii)	(iv)
GDPpc (t-1)	-0.0229*** (0.0032)	-0.0181*** (0.0026)	-0.0183*** (0.0027)	0.0243*** (0.0071)
SFpc (t-1)	-0.0003 (0.0010)	0.0009 (0.0007)	-0.0098*** (0.0018)	0.1051*** (0.0170)
above median SFpc * SFpc (t-1)			0.0091*** (0.0021)	
GDPpc (t-1) * SFpc (t-1)				-0.0105*** (0.0017)
above median SFpc			-0.0229*** (0.0083)	
Year FE	NO	YES	YES	YES
Region FE	NO	NO	NO	NO
Observations	2,466	2,466	2,283	2,466
R-squared	0.0433	0.5156	0.5304	0.5235
Average Marginal Effects				
SFpc			-0.0098*** (0.0018)	
Below median			-0.0007 (0.0013)	
Above median				
GDPpc (t-1)				-0.0177*** (0.0026)
SFpc				0.0006 (0.0007)

Notes: GDPpc denotes GDP per capita, SFpc the amount of Structural Fund expenditures per capita in the region and year, and above/below median is a dummy variable that identify regions in which SFpc are above/below the median amount of SFpc. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5.2. Estimation of the effect of Structural Fund expenditures. Extended model.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
GDPpc (t-1)	-0.2472*** (0.0202)	-0.2217*** (0.0166)	-0.1099*** (0.0170)	-0.0863*** (0.0139)	-0.1045*** (0.0148)	-0.0545*** (0.0202)
SFpc (t-1)	0.0094*** (0.0018)	0.0097*** (0.0017)	0.0053*** (0.0013)	0.0057*** (0.0012)	-0.0025 (0.0030)	0.1595*** (0.0270)
above median SFpc * SFpc (t-1)					0.0104*** (0.0033)	
GDPpc (t-1) * SFpc (t-1)						-0.0155*** (0.0027)
Primary educ (t-1)	-0.0240** (0.0105)	-0.0331*** (0.0101)	-0.0082 (0.0065)	-0.0050 (0.0061)	-0.0049 (0.0073)	-0.0082 (0.0065)
Tertiary educ (t-1)	-0.0110 (0.0095)	-0.0050 (0.0087)	-0.0073 (0.0062)	-0.0019 (0.0057)	-0.0108* (0.0062)	-0.0089 (0.0062)
Motorways (t-1)	0.0075*** (0.0025)		0.0053*** (0.0015)		0.0066*** (0.0021)	0.0046*** (0.0016)
Employment rate (t-1)	0.0020 (0.0026)	0.0017 (0.0019)	0.0011 (0.0014)	0.0008 (0.0010)	0.0025* (0.0014)	0.0014 (0.0013)
Density employment (t-1)	0.0683 (0.1563)	0.0467 (0.1108)	-0.0059 (0.0888)	-0.0096 (0.0587)	-0.0893 (0.0879)	-0.0087 (0.0795)
Density population (t-1)	-0.0809 (0.1574)	-0.0607 (0.1134)	0.0067 (0.0886)	0.0080 (0.0588)	0.0899 (0.0880)	0.0083 (0.0793)
Country growth			0.9346*** (0.0243)	0.9194*** (0.0231)	0.9434*** (0.0245)	0.9276*** (0.0231)
above median SFpc					-0.0407*** (0.0128)	
Year FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Observations	1,968	2,307	1,926	2,244	1,795	1,926
R-squared	0.6519	0.6236	0.8250	0.8210	0.8365	0.8284
Average Marginal Effects						
	Below median				-0.0025 (0.0030)	
SFpc	Above median				0.0079*** (0.0015)	
GDPpc (t-1)						-0.1152*** (0.0182)
SFpc						0.0033*** (0.0010)

Notes: GDPpc denotes GDP per capita, SFpc the amount of Structural Fund expenditures per capita in the region and year, and above/below median is a dummy variable that identify regions in which SFpc are above/below the median amount of SFpc. Control variables as described in the text. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported.

Based on the results reported in column (vi) of Table 5.2, the estimated effects of initial per capita GDP along the distribution of Structural Funds expenditures have been computed. They are represented in the graph at the top of Figure 5.3, together with the corresponding confidence intervals. Similarly, the estimated effects of the latter magnitude along the distribution of the former are depicted in the graph at the bottom of this figure. It is observed that there are differences in the effect of each variable depending on the values of the other. This is particularly so in the case of the intensity of the policy. In fact, a significant positive effect of the policy is only derived for the deciles below the median of the regional distribution of GDP per capita. Above the fifth decile the effect of the policy turns out to be statistically insignificant, and even negative at the top of the distribution.

Overall, the results from the set of regions that includes those of the newest member states, and the years of the last completed programming period, lead us to conclude that there could be significant positive effects of the Structural Funds expenditures on growth of per capita GDP. However, this positive impact of the policy seems to be concentrated in regions that receive large relative amounts of funds and, therefore, in those with the lowest levels of development. In fact, the effect of the policy could be negative above the median of the regional distribution of per capita GDP. This suggests that the Cohesion Policy would effectively contribute to diminishing regional disparities in the EU.

5.4.3. The effect of regional growth and convergence on the perception of the EU.

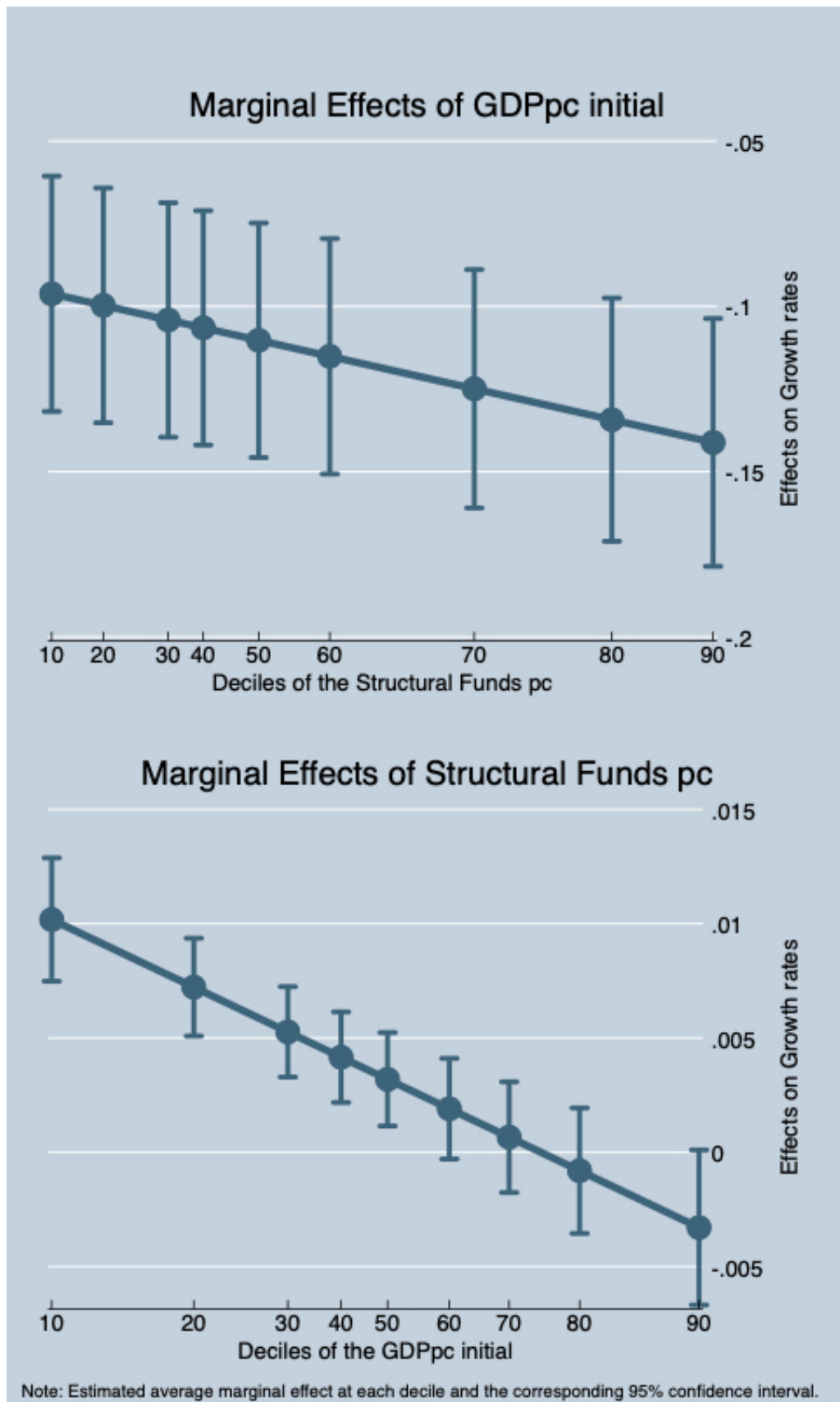
An expanded version of the empirical model in equation (4.2) is used in this section to assess the influence of regional growth and convergence on the degree of support for the European project in the region and the attitude of its citizens towards the Union. To be clear, the results in this section are obtained from the estimation of the coefficients in the following specification:

$$Perception_EU_{it} = \alpha_i + \delta_t + \beta \cdot growth_{it} + Z_{it}\gamma + \varepsilon_{it} \quad (5.2)$$

where *Perception_EU* is any of the measures of support and attitudes defined in section 3.2 and *growth* denotes an indicator of economic growth experienced by the region in a period immediately before the measurement of the perception of citizens. To be clear, the following indicators are considered:

- Growth of per capita GDP in the previous five years. It aims to capture the direct effect of a positive economic evolution in the region on the perception of the EU.

Figure 5.3. Marginal effects at different initial GDPpc and SFpc at the deciles of the distributions.



Note: Computed from the specification with regional controls (Column vi in Table 5.2).

- Growth of per capita GDP in the previous five years of regions below and above the average GDP per capita in the EU.³⁸ This distinction allows us to check if there are asymmetries in the effect of growth depending on the relative economic situation of the region.
- Growth in the region relative to the one experienced by the EU as a whole. This is measured as the change over a period of five-year in the deviation between GDP per capita in the region and the EU average.
- Relative growth for regions below and above the EU average of GDP per capita. It is an approximation to convergence/divergence to the average income per capita in the EU.
- A set of dummy variables defined based on the growth in the region over the five-year period relative to growth in the entire EU, and its initial gap in GDP per capita relative to the EU average. Four categories are defined: i) Convergence from above, when growth in the region was lower than in the EU as a whole and its GDP per capita was above the EU average; ii) Convergence from below, when the region grew faster than the EU and its GDP per capita was below the average; iii) Divergence from below, that is the case of regions that grew less and had lower initial GDP per capita than the EU; and iv) Divergence from above, which is the category of the most developed regions that grew faster than the average.

The set of controls of the economic situation in the region included in Z is similar to that used in section 4.4: total Structural Fund payments per capita, level of per capita GDP, percentage of population with tertiary education, employment rate, and population density. They are measured in the year before the beginning of the period used to compute the indicators of perception. In addition, year fixed effects (δ_t) are included in all specifications, whereas region fixed effects (α_i) are added in those that account for the economic situation in the region.

The results for the two indicators of support for the EU are summarised in Tables 5.3 and 5.4. The first one refers to support based on the belief that the country's membership to the EU is a good thing. Columns (i) to (iii) show the estimation of the coefficients in equation (5.2) when using the five-year growth and its interaction with being above or below the EU average of per capita GDP. It can be observed that support for the EU seems to be higher among regions that grew at a faster pace. Based on the most comprehensive specification that includes the

³⁸ The threshold is specific to each of the subperiods under analysis.

observed and unobserved regional controls, it can be deduced that, on average, a one percentage point increase in the growth rate over the previous five years stimulated support by 2.3 p.p. in regions above the average, and by 1 p.p. in those below the EU per capita GDP. Therefore, there seems to be a positive association between regional growth and support for the EU, as measured by the indicator used in Table 5.3, which, however, could be moderate in the case of regions with medium and low levels of income per capita.

To explore further the impact of growth on support, columns (iv) to (vi) show the results for the effect of growth in the region relative to the EU as a whole. They clearly point to a positive effect of differential growth on support. In other words, support was higher among the regions that improved their level of GDP per capita with respect to that of the EU as a whole. As in the previous case, the bulk of this positive effect of differential growth on support seems to be due to the impact of regions with medium and high levels of GDP per capita. For regions with initial per capita GDP above the average, one p.p. increase in the gap of this magnitude is associated with an increase of 0.5-0.6 p.p. in support for the EU. By contrast, the induced increase in support is only about 0.1 p.p. for regions below the EU per capita GDP.

Finally, columns (vii) and (viii) report the results when the set of dummy variables that aim to capture the convergence/divergence behaviours is used. The omitted category is 'Divergence from above'. Therefore, the coefficients of the dummies included in the specifications in columns (vii) and (viii) capture the differences in support of each category of regions with respect to those that grew at a faster pace and their initial GDP per capita was above the average. The results from the simple specification that does not control for regional characteristics (column vii) suggest that, relative to regions that diverged from above, support was significantly lower in the group that diverged having lower than the average initial GDP per capita. As can be observed, support is also lower in the two groups that converged to the EU average. This would confirm that middle- and low-income regions that experienced slow growth were the less supportive for the EU. This is consistent with the discontent caused by the decrease in the relative income levels in these regions, particularly with respect to regions with similar levels of income that grew faster (converged to the EU average). This evidence also agrees with the argument that support for the EU is broader in the regions that benefit most from European integration.

Table 5.3. EU membership as a good thing and convergence of EU regions.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Growth GDPpc	1.8991*** (0.3682)	3.2891*** (0.8963)	2.3411*** (0.7038)					
below EU average GDPpc * Growth GDPpc		-1.0956 (0.8903)	-1.2824** (0.6238)					
Change in deviation GDPpc EU				0.3220*** (0.0679)	0.6959*** (0.2109)	0.5669*** (0.1398)		
below EU average GDPpc * Change deviation GDPpc EU					-0.3369 (0.2243)	-0.4167*** (0.1475)		
Convergence from above							-0.0842*** (0.0278)	-0.0638*** (0.0187)
Convergence from below							-0.0828*** (0.0259)	0.0652** (0.0312)
Divergence from below							-0.1634*** (0.0267)	0.0679** (0.0272)
SF pc (log)			0.0608*** (0.0204)			0.0617*** (0.0200)		0.0464** (0.0206)
GDP pc (log)			-0.2803** (0.1100)			-0.2658** (0.1100)		-0.2900*** (0.1048)
Tertiary educ			0.0016 (0.0037)			0.0012 (0.0037)		0.0005 (0.0038)
Employment rate			0.0090*** (0.0027)			0.0089*** (0.0026)		0.0119*** (0.0027)
Pop. density (log)			-0.0175 (0.2856)			-0.0577 (0.2825)		-0.0308 (0.2929)
below EU average GDPpc		-0.0566 (0.0349)	0.1266*** (0.0338)		-0.0906*** (0.0203)	0.0869*** (0.0248)		
Region FE	NO	NO	YES	NO	NO	YES	NO	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	334	339	339	334	335	330
R-squared	0.0714	0.1639	0.2467	0.0635	0.1602	0.2559	0.1336	0.2574

Notes: Estimations using observations for 175 (173 in columns iii, vi, and viii) regions for the periods 2014-2016 and 2007-2009. Clustered (by region) standard errors in parenthesis. Omitted category in columns (vii) and (viii) is 'Divergence from above'. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported in columns (iii), (vi) and (viii).

Table 5.4. Benefit from EU and convergence of EU regions.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Growth GDPpc	2.8026*** (0.4043)	4.1227*** (0.8492)	1.9754** (0.8199)					
below EU average GDPpc * Growth GDPpc		-1.2681 (0.8623)	-1.0598 (0.7530)					
Change in deviation GDPpc EU				0.4671*** (0.0770)	0.7780*** (0.1826)	0.3269** (0.1576)		
below EU average GDPpc * Change deviation GDPpc EU					-0.3135 (0.1982)	-0.1862 (0.1680)		
Convergence from above							-0.0832*** (0.0262)	-0.0343* (0.0203)
Convergence from below							-0.0111 (0.0250)	0.0723** (0.0329)
Divergence from below							-0.1383*** (0.0237)	0.0586** (0.0287)
SF pc (log)			0.0628** (0.0262)			0.0641** (0.0258)		0.0547** (0.0258)
GDP pc (log)			-0.0416 (0.1315)			-0.0260 (0.1311)		-0.0793 (0.1244)
Tertiary educ			0.0002 (0.0039)			-0.0001 (0.0039)		-0.0003 (0.0040)
Employment rate			0.0096*** (0.0031)			0.0098*** (0.0031)		0.0116*** (0.0032)
Pop. density (log)			0.3771 (0.3077)			0.3464 (0.3083)		0.3502 (0.3102)
below EU average GDPpc		-0.0034 (0.0354)	0.1194*** (0.0310)		-0.0426** (0.0183)	0.0851*** (0.0209)		
Region FE	NO	NO	YES	NO	NO	YES	NO	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	334	339	339	334	335	330
R-squared	0.1652	0.1916	0.2570	0.1430	0.1706	0.2492	0.1605	0.2436

Notes: Estimations using observations for 175 (173 in columns iii, vi, and viii) regions for the periods 2014-2016 and 2007-2009. Clustered (by region) standard errors in parenthesis. Omitted category in columns (vii) and (viii) is 'Divergence from above'. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported in columns (iii), (vi) and (viii).

The inclusion of the variables accounting for the regional economic context and the region fixed effects substantially modifies the results. However, as mentioned above, the region fixed effects eliminate the between variability. Hence, the interpretation of the estimated effects should be made for the changes in support between the two subperiods analysed. Having said that, the estimates reported in column (viii) indicate that among the regions above the level of income per capita in the EU, support decreased for those that converged to the EU average, relative to similar regions that grew faster than the average. Interestingly, the positive coefficient for the groups of regions that were initially below the average level of income per capita suggests that, regardless of the pattern of convergence/divergence, increase in support was more pronounced than for the regions that diverged from above the average.³⁹

The evidence obtained when using the second indicator of support for the EU, the one based on the belief that being member of the EU is beneficial for the country, is summarised in Table 5.4. The results are similar to the ones described for the previous indicator. However, there are a few interesting differences worth mentioning. First, the impact of growth on support does not differ between regions above and below the EU average, as deduced by the lack of significance of the interaction terms. This is so in the case of the absolute measure of growth (columns ii and iii), and when growth in the region is compared to the one in the EU as a whole (columns v and vi).

Therefore, we can conclude that in terms of the perceived benefits of the country's membership in the EU, growth stimulated citizens' support regardless of the level of income of the region. As for the effect associated to the patterns of convergence/divergence, the only difference with the previous indicator of support is the lack of significance of the coefficient of 'Convergence from below' in column (vii), and the smaller and marginally significant effect of the group 'Convergence from above' in the specification that includes the regional controls (column viii). In a nutshell, the results suggest that support, as measured by the 'benefit' indicator, was higher in regions that, starting above the average income, experienced faster growth. This is particularly so in comparison with the regions that worsened their situation, that is, those that converged from above or diverged from below. In terms of changes in support, the difference between the regions above the average income that grew faster or slower than the EU as a whole is almost negligible in this case.

³⁹ Note that these results can, symmetrically, be interpreted in terms of decrease in support. In that case, the positive coefficient for the groups with below-average income is interpreted as a lower decrease in support among the regions in these groups compared to the ones that diverged from above the average.

Regarding the indicators of attitudes towards the EU, the results are reported in Tables 5.5 and 5.6. They confirm a positive effect of growth on trust in the EU and in the positive image that it evokes. In both cases, there seems to be no differences in the impact between regions above and below average income when it comes to explaining the disparities between regions in the indicators (column ii). In the case of the specification that includes the regional controls and the region fixed effects (column iii), the coefficient of the interaction term is only marginally significant, which suggests that the differences in the impact of growth on changes in indicators would be negligible. However, we prefer to be cautious due to the large magnitude of the estimated coefficient of the interaction term, both in the case of trust and in the image of the EU, and to conclude that the effect of growth on these indicators could have been greater in the group of regions with a GDP per capita above the average.

The evidence obtained when using the five-year change in the GDP per capita gap between the region and the EU is very similar to the one discussed for the effect of absolute growth in the previous paragraph. Trust and an optimistic image seem to be more frequent in regions with positive changes in the deviations of income per capita (grew faster). No significant differences are observed in this case between regions above and below the average income (column v). Differential growth also affected positively the changes over the subperiods of trust in the EU and its image (column vi). Interestingly, the effect seems to be constrained to the group of regions above the average income. Particularly in the case of trust in the EU, the coefficient of the interaction terms, that is, the differential effect associated to the regions below the EU average, is negative and highly significant, counterbalancing the overall effect associated with the change in the GDP per capita gap.

Finally, the results for the patterns of convergence/divergence point to some interesting differences with respect to those obtained for the indicators of support for the EU. The ones in column (vii) of Table 5.5 indicate that, compared to regions that diverged from above the average, trust in the EU was less frequent in regions that converged from above or diverged from below. That is to say, regions that performed worse than the EU as a whole. However, when it comes to changes in trust between the subperiods analysed (specification that includes the regional controls and fixed effects –column viii) it seems that there are no differences at all between the regions that converged or diverged to the EU income per capita, from below or from above the average. In general, a similar conclusion is reached for the indicator of the positive image of the EU (Table 5.6), although in this case there may be a positive differential effect in regions that diverged from below (significant at 5%) and in regions that converge from below (significant at 10%).

Table 5.5. Trust in the EU and convergence of EU regions.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Growth GDPpc	2.3890*** (0.2754)	2.5558*** (0.5662)	1.5459** (0.6284)					
below EU average GDPpc * Growth GDPpc		-0.0488 (0.5879)	-1.2183* (0.6404)					
Change in deviation GDPpc EU				0.4194*** (0.0526)	0.4720*** (0.1237)	0.3925*** (0.1132)		
below EU average GDPpc * Change deviation GDPpc EU					-0.0325 (0.1403)	-0.3929*** (0.1294)		
Convergence from above							-0.0528*** (0.0190)	-0.0171 (0.0188)
Convergence from below							0.0142 (0.0180)	0.0457 (0.0405)
Divergence from below							-0.0999*** (0.0201)	0.0592 (0.0403)
SF pc (log)			0.0815*** (0.0220)			0.0805*** (0.0218)		0.0791*** (0.0206)
GDP pc (log)			-0.0195 (0.1223)			-0.0122 (0.1214)		-0.0163 (0.1187)
Tertiary educ			0.0041 (0.0033)			0.0037 (0.0033)		0.0031 (0.0034)
Employment rate			0.0045 (0.0029)			0.0046 (0.0028)		0.0054* (0.0029)
Pop. density (log)			0.2234 (0.2770)			0.1980 (0.2734)		0.2086 (0.2785)
below EU average GDPpc		-0.0251 (0.0249)	0.1105*** (0.0412)		-0.0273* (0.0148)	0.0741** (0.0345)		
Region FE	NO	NO	YES	NO	NO	YES	NO	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	334	339	339	334	335	330
R-squared	0.3709	0.3793	0.6855	0.3650	0.3740	0.6886	0.3558	0.6723

Notes: Estimations using observations for 175 (173 in columns iii, vi, and viii) regions for the periods 2014-2016 and 2007-2009. Clustered (by region) standard errors in parenthesis. Omitted category in columns (vii) and (viii) is 'Divergence from above'. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported in columns (iii), (vi) and (viii).

Table 5.6. Positive image of the EU and convergence of EU regions.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Growth GDPpc	2.2279*** (0.3067)	2.3293*** (0.5809)	1.7737*** (0.6573)					
below EU average GDPpc * Growth GDPpc		-0.0270 (0.5935)	-1.1621* (0.6609)					
Change in deviation GDPpc EU				0.3966*** (0.0575)	0.4051*** (0.1304)	0.3391** (0.1356)		
below EU average GDPpc * Change deviation GDPpc EU					0.0084 (0.1437)	-0.2462* (0.1420)		
Convergence from above							-0.0451** (0.0178)	-0.0034 (0.0169)
Convergence from below							0.0175 (0.0201)	0.0731* (0.0425)
Divergence from below							-0.0750*** (0.0188)	0.0766** (0.0378)
SF pc (log)			0.0869*** (0.0284)			0.0885*** (0.0279)		0.0838*** (0.0254)
GDP pc (log)			-0.0225 (0.1148)			-0.0075 (0.1149)		-0.0414 (0.1140)
Tertiary educ			0.0089*** (0.0030)			0.0086*** (0.0030)		0.0086*** (0.0031)
Employment rate			0.0066** (0.0026)			0.0066** (0.0025)		0.0087*** (0.0026)
Pop. density (log)			0.1879 (0.2516)			0.1509 (0.2543)		0.1773 (0.2618)
below EU average GDPpc		-0.0158 (0.0204)	0.1274*** (0.0350)		-0.0178 (0.0129)	0.0909*** (0.0324)		
Region FE	NO	NO	YES	NO	NO	YES	NO	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	334	339	339	334	335	330
R-squared	0.2853	0.2893	0.5932	0.2827	0.2872	0.5908	0.2423	0.5693

Notes: Estimations using observations for 175 (173 in columns iii, vi, and viii) regions for the periods 2014-2016 and 2007-2009. Clustered (by region) standard errors in parenthesis. Omitted category in columns (vii) and (viii) is 'Divergence from above'. *** p<0.01, ** p<0.05, * p<0.1. The within-R-squared is reported in columns (iii), (vi) and (viii).

Overall, the results from the analysis carried out in this section suggest that regional growth contributes to explain differences across regions with regard to the degree of support for the European project and the citizens' attitudes towards the EU. It can also explain some of the regional differences in changes in support and attitudes during the period under analysis, discussed in Chapter 3. Finally, the evidence is mixed with regard to the association between support and attitudes, and convergence or divergence towards the EU average. The effect of converging or diverging to the EU average income, from above or below it, seems to be clearer for the indicators of support than for those of the citizens' attitudes towards the EU. Differences also exist in terms of explaining the regional variability in support and attitudes or the change in perceptions.

5.5. Summary of results.

This chapter has studied the impact of the intensity of the Cohesion Policy on regional growth, and whether growth and convergence towards the average per capita income in the EU affects the citizens' perception of the Union. The main findings can be summarised in the following points:

- i. The study of the evolution of the regional distribution of GDP per capita throughout the period analysed reveals a trend towards convergence. The polarization in two groups of regions observed in the first part of the 2000s vanishes by the end of the decade. This was due to the improvement in the level of income experienced by the less developed regions. However, this trend towards convergence is not observed in the last part of the period analysed.
- ii. Although most of the disparities in GDP per capita correspond to differences between countries, those within countries are far from negligible. Sizeable disparities have also been observed between regions with a similar intensity of the Cohesion Policy.
- iii. The evidence so far is not conclusive on the growth effect of the intensity of the Cohesion Policy. The estimated impact varies between types of regions and programming periods. It may also depend on the quality of the data about the EU funds used in the studies. The results from samples including regions from the newest member states and the most recently completed programming period (2007–2013) are still scarce.
- iv. From the analyses performed in this chapter it can be concluded that regional growth increases with the intensity of the Cohesion Policy. Based on the preferred estimates, it can be said that annual growth increases by 0.5-0.6

percentage points when doubling total Structural Fund expenditures per capita.

- v. The growth impact of the Structural Fund expenditures per capita could vary markedly between regions. Indeed, it seems to be positive only for the group of regions where the intensity of the policy is above the median.
- vi. Similarly, the estimated positive effect of EU funds decreases with the level of development of the regions, as proxied by its per capita GDP. A significant positive effect of the policy is only derived for the deciles below the median of the regional distribution of GDP per capita. Above the fifth decile the effect of the policy turns out insignificant and could even be negative at the top of the income per capita distribution.
- vii. A relationship between growth in the region and support for, and attitudes towards, the EU can be deduced from the arguments of the utilitarian model of public support for European integration. A better perception of the EU can be expected in regions that benefit most from the integration process, and where individuals perceive better economic prospects for the region.
- viii. So far, there is no direct evidence in the literature about the effect of regional growth, and convergence, on the degree of support for the European project and the citizens' attitudes towards the EU. Only some studies using individual-level data have included GDP growth as an aggregate control of support for European integration and identification with Europe. Their results point to a negative effect, particularly during the initial years of the Great Recession. However, all these studies have considered national rather than regional growth.
- ix. The evidence in this chapter is conclusive about a positive relationship between growth in the region and the indicators of support for and attitudes towards the EU. The effect of regional growth remains significant and sizeable after controlling for the amount of Structural Funds spent in the region, several characteristics of the economic context, and region fixed effects.
- x. From the results in this chapter, it is not possible to derive a unanimous conclusion as to the association between support and attitudes and convergence or divergence towards the EU average. The effect of converging or diverging towards the EU's average income, from above or below, is stronger for the indicators of support than for those of citizens' attitudes towards the EU. And in that case, the impact of the convergence/divergence patterns on the relative levels of regional support differ from that on the changes in support over the periods analysed.

- xi. Given that the results in this chapter confirm that the Cohesion Policy funds encourage growth, and growth stimulates support for the EU and positive attitudes towards the Union, it can be deduced that, in addition to a direct effect of the policy on regional development, there is likely to be an indirect impact on support to the EU operating through the improvement of the economic prospects of the regions.

6. Summary and conclusions.

The findings that have been obtained in the analyses carried out in this deliverable can be summarised in the following points:

1. In addition to the ratio between Cohesion Policy funds allocated in the region and effective payments, it is important to consider alternative measures of the effectiveness in the absorption of the funds. In particular, interesting insights can be derived from comparisons of the speed in the implementation of the Structural Funds. The share of expenditures accumulated after a given number of years of implementation of the programme, and the years needed to accumulate a given percentage of the amount allocated provides a complementary view of the measures based on the amounts allocated and spent.
2. Full absorption in the OP 2007-2013 was more the exception than the rule. The low absorption rates can be thought to be related to the crisis that most European economies suffered during most of the OP, which may have implied delays due to the inability to carry out planned payments because of troubles of getting the co-funding or because of investing being deferred in the framework of the insecurity produced by the crisis.
3. There are sizeable differences between countries and regions in the absorption rate and the measures of speed in the implementation of the policy. Absorption rates correlate positively with higher endowments of human capital and specialisation in high-tech sectors. However, speed of implementation seems to increase with income per capita.
4. Lack of timely available regional data on EU fund payments for the 2007–2013 programming period hinders the analysis of the effectiveness of the regional absorption of the funds. This is expected to change in the case of the current programming period as a result of the efforts made by the European Commission in making data on expenditures readily available. However, comparability with previous programming periods will not be possible. Additionally, other shortcomings can remain due to complexities in the management and accounting of the funds of the Cohesion Policy.
5. Differences between countries and regions in the citizens' perception of the EU are sizeable and persistent. They are found in the EU 28 as a whole and within the groups of the oldest and newest member states.
6. The degree of support for the EU evolved from 2000 to 2016 with significant differences between countries and regions. The changes were even more

obvious in the case of the citizens' attitudes towards the EU. Trust in the EU and the positive image that it evoked decreased sharply since the crisis, but not uniformly in all countries and regions. As a result, persistence over time in support is higher than in attitudes. In other words, attitudes are more responsive to specific circumstances than support for the EU project.

7. Cohesion Policy investments may be contributing to alleviate the economic deficits in the less favoured European regions. If so, they could be having an effect on the perception that citizens have of the EU. However, the evidence from a large sample of regions in the period analysed is mixed. The sign and significance of the effect depends on the particular indicator of perception. Interestingly, the estimated effect differs markedly between the specifications that use all the variation in the data and those that only use the variation associated with changes over the period analysed. This suggests that the effect of EU funds on regional disparities in perceptions may be different to the one they play in the evolution over time of perceptions.
8. There is no correlation between the rate of absorption of Cohesion Policy funds and the indicators of EU support and attitudes. However, results using the measures of the speed of implementation suggests that an efficient use of the Structural Funds allocated to the region can indeed contribute to improve support and stimulate positive attitudes towards the EU.
9. The regional context, in terms of the socio-economic, territorial, and institutional characteristics, matters when it comes to the citizens' perception of the EU. However, the specific effects vary for the different components of the context, and affect differently the indicators of support and attitudes. In addition, some of them are more related to the differences between the regions, while others are more related to the changes over time experienced by the perceptions.
10. Consistent with the evidence reported in previous studies, the reduction of regional disparities in the EU came to an end at the onset of the Great Recession. In any case, the polarization of the regional distribution of GDP per capita detected in the early 2000s has not been observed in the most recent years.
11. As in previous studies using data from the most recent programming periods, the results of this deliverable lead us to conclude that regional growth increases with the intensity of the Cohesion Policy. Doubling the total Structural Funds expenditures per capita in one region would induce additional growth of approximately half a percentage point per year.

12. The growth effect of the Cohesion Policy could be highly heterogeneous across regions. The growth induced by EU funds expenditures is only observed in regions where the intensity of the policy is above the median. Accordingly, a positive effect of the policy is estimated for regions above the median of the GDP per capita distribution. The effect turns insignificant and even negative for regions at the top of the regional income distribution.
13. The novel evidence in this deliverable strongly supports a positive impact of growth in the region on the citizens' perception of the EU. This is so for the indicators of support and attitudes, and once controlling for observed and unobserved characteristics of the economic context of the region. However, results are not unanimous as to the effect of convergence of the less developed regions to the average income per capita in the EU. The effect of converging or diverging towards the EU's average income, from above or below, is stronger for the indicators of support than for those of the citizens' attitudes towards the EU. In addition, the influence of convergence on changes over time in regional support differs from its impact on the particular (relative) level of support in the region.
14. Through its positive and significant effect on growth, and given that there is evidence that growth could be favouring more positive perceptions of the EU, it can be concluded that, as a kind of side effect, Cohesion Policy investments may be helping to increase support for the European project and positive attitudes towards the EU. Nevertheless, the effect may vary widely between regions, depending on its specific circumstances and the relative amount of EU funds it receives.

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ANNEXES

Annex 2.1. Data to compute the absorption rates in the OP 2000-2006

In the dataset of the DG REGIO, under the level of Historic data on SF by member state and in the section of 'Geography of expenditure study, August 2015 (Ex post 2007-2013)' you may find the integrated database of allocations and expenditures for 2000-2006/2007-2013. The data is disaggregated for 12 categories. Find in Figure A2.1 a view of the information provided for the 2000-2006 period. Although information for the OP 2007-2013 is also included, the expenditures are only updated until 2014 (and not until 2016).

Figure A2.1 Data on SF allocations and payments for the OP 2000-2006

NUTS	Category	Commitments_2006	Payments_2006	Allocations_2013	Expenditures_2013	Allocations_2014	Expenditures_2014	NOTES_Commitments_2006	NOTES_Payments_2006	NOTES_Allocations_2013	NOTES_Expenditures_2013	NOTES_Allocations_2014	NOTES_Expenditures_2014
AT11	Business support	101687568	101687568	56977240	48386468	63245316	58450140	100% Objective1	100% Objective1	100% Convergence	100% Convergence	100% Convergence	100% Convergence
AT11	Energy	5468862	5468862	1955131	1087009	2437505	1085503	100% Objective1	100% Objective1	100% Convergence	100% Convergence	100% Convergence	100% Convergence
AT11	Environment and r	5316971	5316971	0	0	0	0	100% Objective1	100% Objective1				
AT11	Human resources	0	0	0	0	0	0						
AT11	IT infrastructure an	2619528	2619528	930213	489013	1241037,5	1077037,5	100% Objective1	100% Objective1	100% Convergence	100% Convergence	100% Convergence	100% Convergence
AT11	Other	0	0	0	0	0	0						
AT11	Research and Tech	7348521	7348521	25222612	17745958	29751686	21596210	100% Objective1	100% Objective1	100% Convergence	100% Convergence	100% Convergence	100% Convergence
AT11	Social infrastruc	0	0	0	0	0	0						
AT11	Technical assistanc	2573008	2573008	6461896	2973100,3	6726077	4116779,8	100% Objective1	100% Objective1	100% Convergence	100% Convergence	100% Convergence	100% Convergence
AT11	Tourism & Culture	50292872	50292872	10808683	8514437	11346746	10088818	100% Objective1	100% Objective1	100% Convergence	100% Convergence	100% Convergence	100% Convergence
AT11	Transport infrastru	0	0	0	0	0	0						
AT11	Urban and rural reg	0	0	0	0	0	0						
AT12	Business support	79517384	79517384	40498876	27791786	42368620	34232280	100% Objective2	100% Objective2	100% RCE	100% RCE	100% RCE	100% RCE
AT12	Energy	4966362	4966362	8246540	3709246	7200294	5625021	100% Objective2	100% Objective2	100% RCE	100% RCE	100% RCE	100% RCE
AT12	Environment and r	0	0	4779885,5	3743382,8	5476678,5	4422535,5			100% RCE	100% RCE	100% RCE	100% RCE
AT12	Human resources	0	0	1330164,8	1330164,8	1712095,9	1712095,9			100% RCE	100% RCE	100% RCE	100% RCE

Annex 2.2. Geographical distribution of expenditures of the OP 2007-2013 (update 2014)

Figure A2.2a Expenditures per capita. ERDF+CF in OP 2007-2013

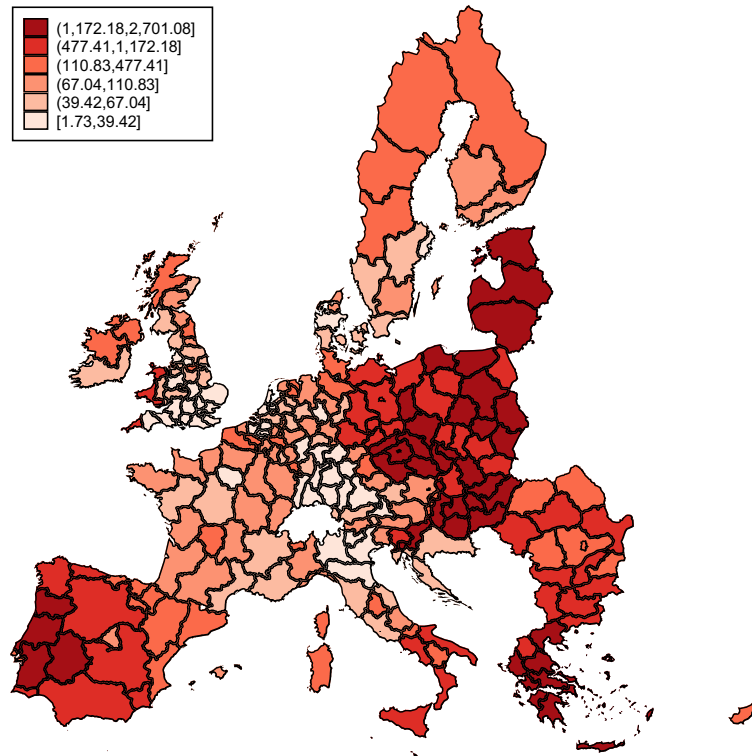
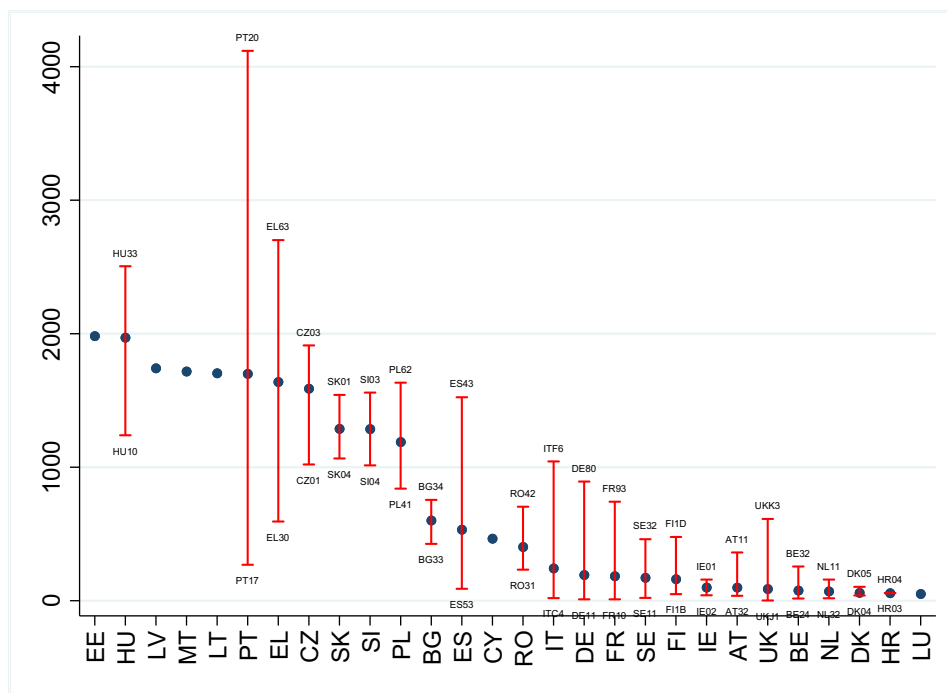


Figure A2.2b Regional variation of expenditures pc. ERDF+CF in OP 2007-2013



Annex 2.3. Geographical distribution of the speed in the implementation of the CP (with annual payments)

Figure A2.3a. Share of expenditures in the first 3 years of the OP 2007-2013

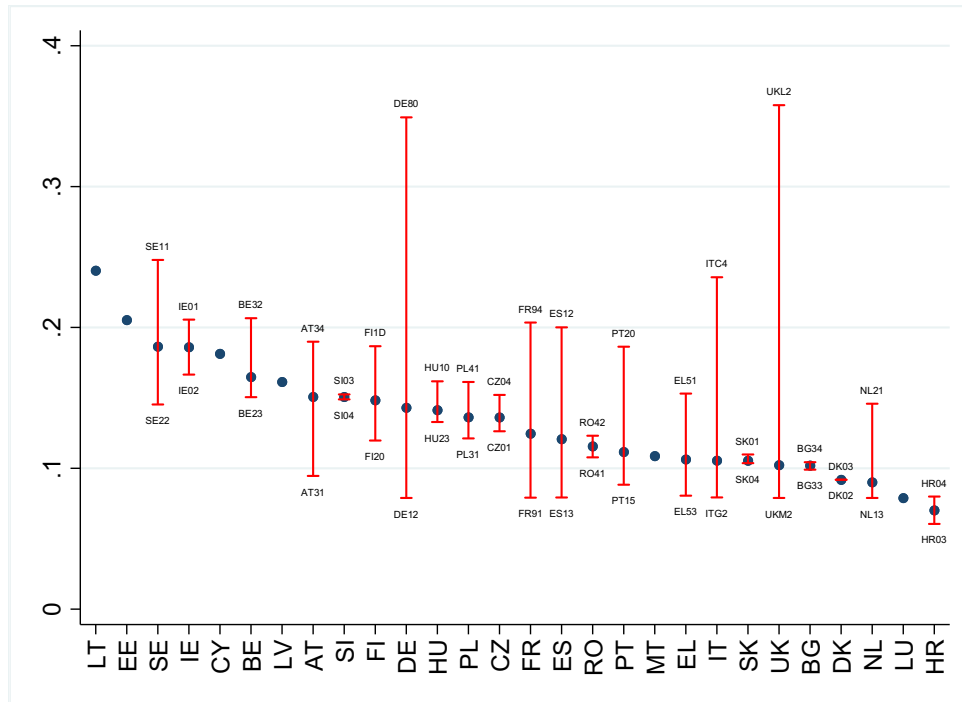


Figure A2.3b. Share of expenditures in the first 5 years of the OP 2007-2013

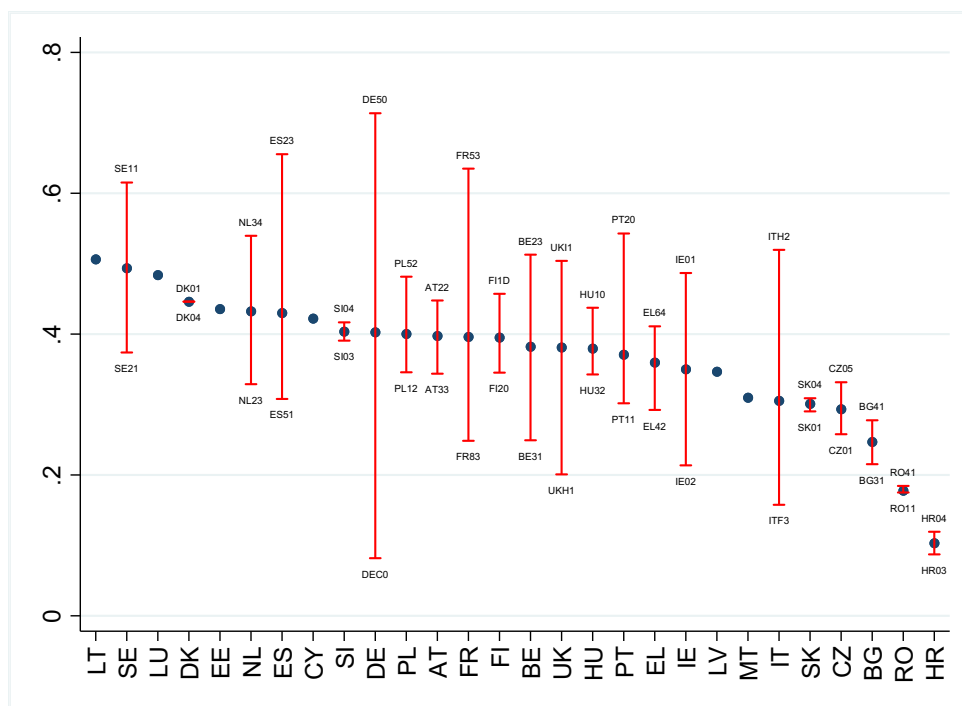


Figure A2.3c. Share of expenditures in the last 3 years of the OP 2007-2013

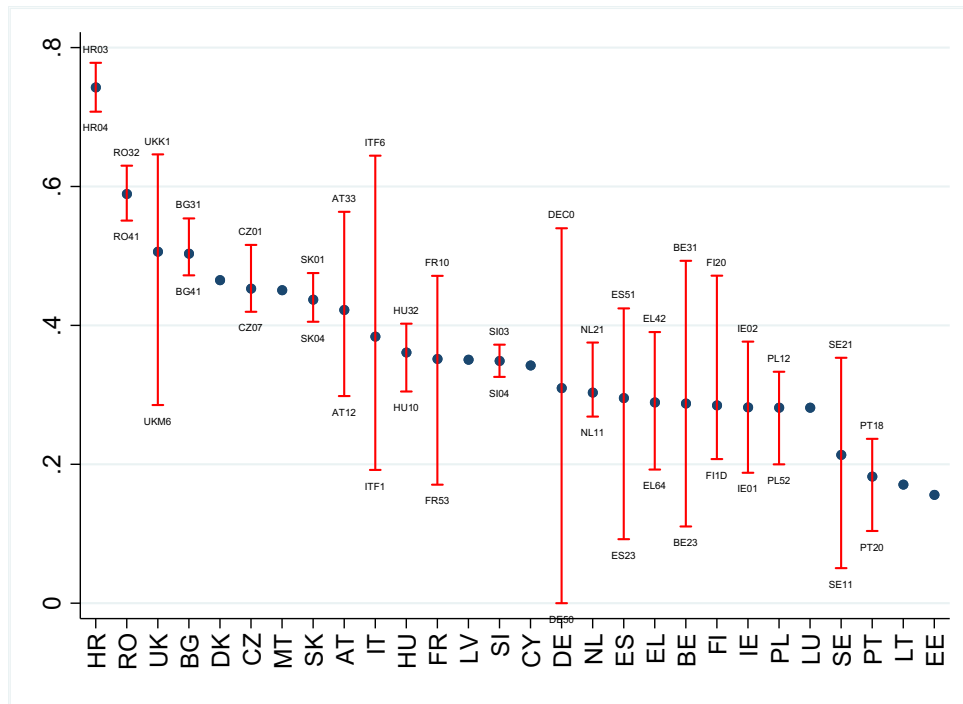


Figure A2.3d. Years needed to accumulate 25% of expenditures

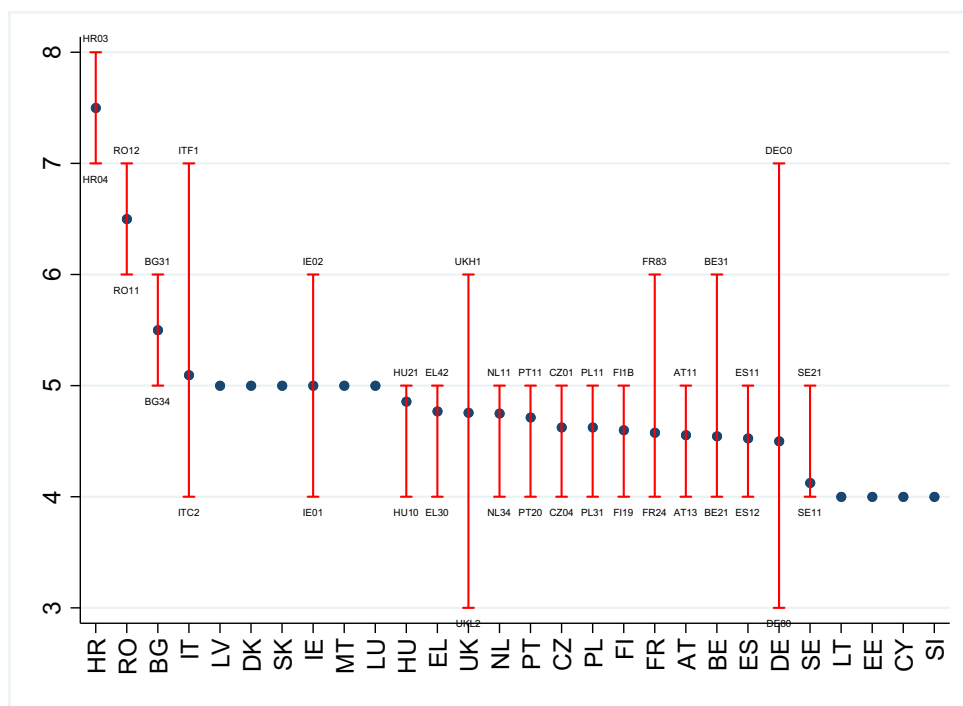


Figure A2.3e. Years needed to accumulate 50% of expenditures

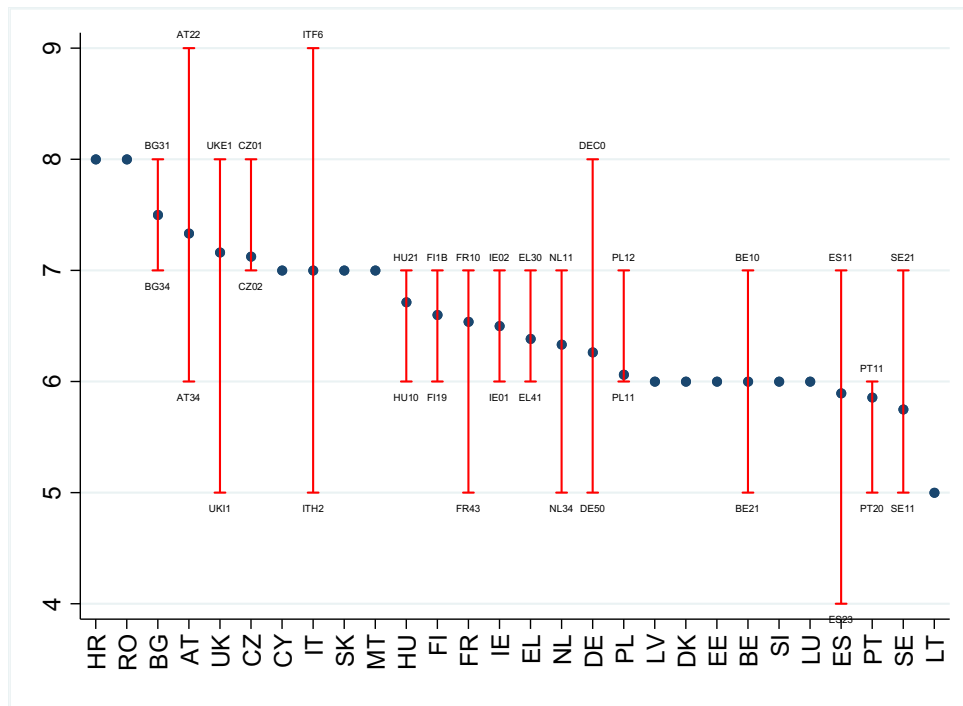
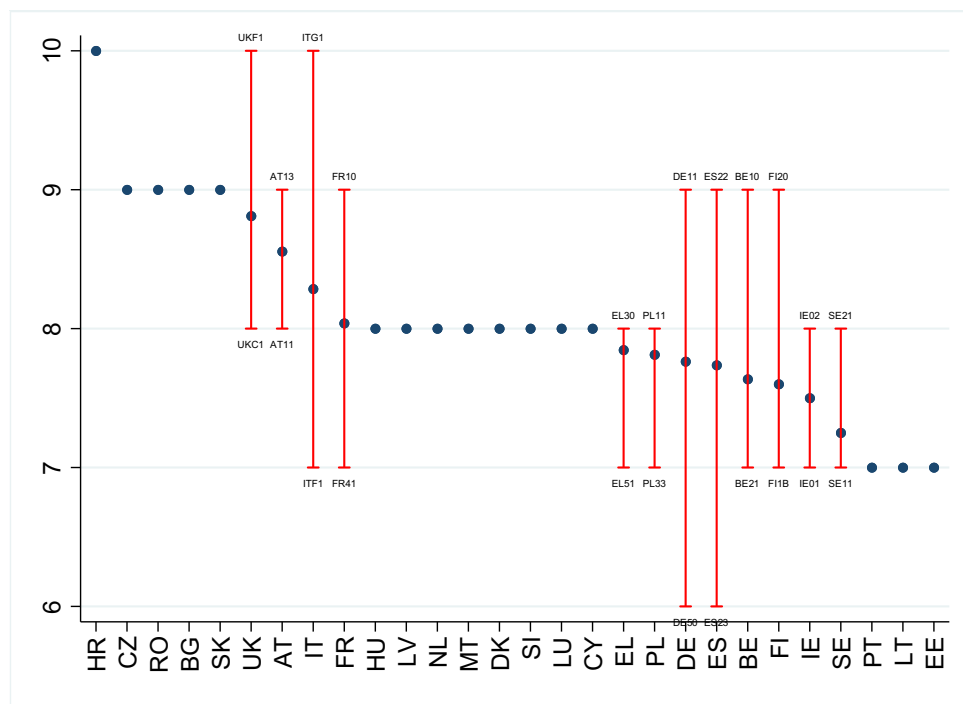


Figure A2.3f. Years needed to accumulate 75% of expenditures



Annex 3. List of regions and further results for the indicators of perception of the EU.

Table A3.1. List of regions used in the analysis.

Country	Regions
AT	Burgenland, Niederösterreich, Wien, Kärnten, Steiermark, Oberösterreich, Salzburg, Tirol, Vorarlberg
BE	Bruxelles-Capitale / Brussels, Hoofdstedelijk Gewest, Prov. Antwerpen, Prov. Limburg (BE), Prov. Oost-Vlaanderen, Prov. Vlaams-Brabant, Prov. West-Vlaanderen, Prov. Brabant Wallon, Prov. Hainaut, Prov. Liège, Prov. Luxembourg (BE), Prov. Namur
BG	Северозападен (Severozapaden), Северен централен (Severen tsentralen), Североизточен (Severoiztochen), Югоизточен (Yugoiztochen), Югозападен (Yugozapaden), Южен централен (Yuzhen tsentralen)
CY	Κύπρος (Kypros)
CZ	Praha, Střední Čechy, Jihozápad, Severozápad, Severovýchod, Jihovýchod, Střední Morava, Moravskoslezsko
DE	Baden-Württemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein, Thüringen
DK	Hovedstaden, Sjælland, Syddanmark, Midtjylland & Nordjylland
EE	Eesti
ES	Galicia, Principado de Asturias & Cantabria, País Vasco, Comunidad Foral de Navarra & La Rioja, Aragón, Comunidad de Madrid, Castilla y León, Castilla-La Mancha, Extremadura, Catalunya, Comunidad Valenciana, Illes Balears, Andalucía, Región de Murcia, Canarias
FI	Etelä-Suomi, Länsi-Suomi, Helsinki-Uusimaa, Pohjois- ja Itä-Suomi
FR	Île de France, Champagne-Ardenne & Alsace, Picardie, Haute-Normandie, Centre, Basse-Normandie, Nord - Pas-de-Calais, Lorraine, Franche-Comté & Bourgogne, Pays de la Loire, Bretagne, Poitou-Charentes & Limousin, Aquitaine, Midi-Pyrénées, Rhône-Alpes & Auvergne, Languedoc-Roussillon, Provence-Alpes-Côte d'Azur
GB	North East (England), North West (England), Yorkshire and the Humber, East Midlands (England), West Midlands (England), East of England, London, South East (England), South West (England), Wales, Scotland, Northern Ireland
GR	Βορεια Ελλάδα (Voreia Ellada), Κεντρικη Ελλάδα (Kentriki Ellada) & Αττική (Attiki), Νησια Αιγαίου, Κρήτη (Nisia Aigaiou, Kriti)
HR	Jadranska Hrvatska, Kontinentalna Hrvatska
HU	Közép-Magyarország, Közép-Dunántúl, Nyugat-Dunántúl, Dél-Dunántúl, Észak-Magyarország, Észak-Alföld, Dél-Alföld
IE	Border and Midland and Western, Southern and Eastern
IT	Piemonte & Liguria, Lombardia, Abruzzo, Campania, Puglia & Basilicata, Sicilia & Calabria, Sardegna, Veneto & Provincia Autonoma di Bolzano/Bozen, Emilia-Romagna, Toscana, Marche & Umbria, Lazio
LT	Lietuva
LU	Luxembourg
LV	Latvija

MT	Malta
NL	Groningen, Friesland (NL), Drenthe, Overijssel & Flevoland, Gelderland, Utrecht, Noord-Holland, Zuid-Holland, Noord-Brabant & Zeeland, Limburg (NL)
PL	Łódzkie, Mazowieckie, Małopolskie, Śląskie, Lubelskie, Podkarpackie, Świętokrzyskie & Opolskie, Podlaskie, Wielkopolskie, Zachodniopomorskie, Dolnośląskie & Lubuskie, Kujawsko-pomorskie, Warmińsko-mazurskie, Pomorskie
PT	Norte, Algarve, Centro (PT), Área Metropolitana de Lisboa, Alentejo
RO	Nord-Vest, Centru, Nord-Est, Sud-Est, Sud – Muntenia, București – Ilfov, Sud-Vest Oltenia, Vest
SE	Östra Sverige, Södra Sverige, Norra Sverige
SI	Vzhodna Slovenija, Zahodna Slovenija
SK	Bratislavský kraj, Západné Slovensko, Stredné Slovensko, Východné, Slovensko

Table A3.2. Degree of persistence in the indicators in the groups of countries.

	Sample	Coeff (s.e.)	R ²
Membership	EU28 2007-09/2014-16	0.68 (0.126)	0.52
	EU15 2007-09/2014-16	0.92 (0.171)	0.69
	EU13 2007-09/2014-16	0.44 (0.192)	0.32
	EU15 2000-02/2007-09/2014-16	0.82 (0.109)	0.66
Benefit	EU28 2007-09/2014-16	0.66 (0.140)	0.46
	EU15 2007-09/2014-16	0.73 (0.189)	0.54
	EU13 2007-09/2014-16	0.62 (0.211)	0.44
	EU15 2000-02/2007-09/2014-16	0.69 (0.098)	0.64
Trust	EU28 2007-09/2014-16	0.38 (0.190)	0.13
	EU15 2007-09/2014-16	0.44 (0.246)	0.20
	EU13 2007-09/2014-16	0.14 (0.300)	0.02
	EU15 2000-02/2007-09/2014-16	0.60 (0.163)	0.32
Positive Image	EU28 2007-09/2014-16	0.38 (0.149)	0.20
	EU15 2007-09/2014-16	0.41 (0.198)	0.25
	EU13 2007-09/2014-16	0.33 (0.222)	0.17
	EU15 2000-02/2007-09/2014-16	0.60 (0.129)	0.44

Notes: Coeff (s.e.) refers to the estimate of the coefficient and its standard error in a regression between the level of the indicator in each country in a period and in the previous period. Observations used in the estimations are countries of the EU 28, EU 15 and EU 13. The periods used in each case are those indicated in the column labelled as Sample. R² is the coefficient of determination of the corresponding regression.

Table A3.3. Descriptive statistics of the indicators of support to the EU.

Indicator	Sample	Period	Mean	Std. Dev	10%	25%	50%	75%	90%	
Membership	EU 28	2007-09	54.4	14.8	34.4	43.4	55.8	66.5	73.5	
		2014-16	53.1	14.6	35.1	42.8	52.6	64.5	72.2	
	EU 15	2000-02	54.7	14.1	34.6	44.2	56.3	64.5	72.2	
		2007-09	55.2	15.1	35.0	43.4	55.9	68.1	74.7	
		2014-16	53.8	15.8	34.0	42.1	54.0	66.7	73.1	
	EU 13	2007-09	52.8	14.0	29.0	44.0	55.6	64.6	68.7	
		2014-16	51.7	11.4	35.4	43.2	50.8	62.3	66.5	
	Benefit	EU 28	2007-09	59.4	14.4	40.4	46.2	61.2	72.3	77.5
2014-16			60.9	14.6	42.3	51.3	61.9	71.6	79.3	
EU 15		2000-02	53.0	14.7	32.1	40.7	54.5	64.7	70.9	
		2007-09	58.3	14.2	41.1	45.7	58.8	70.1	77.0	
		2014-16	58.0	14.4	37.3	48.6	59.5	69.3	76.0	
EU 13		2007-09	61.8	14.7	39.9	47.3	65.4	74.7	78.4	
		2014-16	67.4	13.1	47.3	60.5	65.8	77.9	84.6	
Trust		EU 28	2007-09	53.8	12.3	37.5	46.8	55.6	62.8	67.0
	2014-16		39.2	11.9	24.7	30.5	39.6	47.3	54.6	
	EU 15	2000-02	55.0	14.6	32.1	43.6	58.5	66.0	71.3	
		2007-09	51.6	13.2	33.5	42.7	51.1	61.7	66.7	
		2014-16	35.6	10.8	21.0	28.1	34.2	43.9	49.5	
	EU 13	2007-09	58.7	8.2	47.3	54.6	59.6	63.7	67.7	
		2014-16	47.3	10.3	32.2	40.5	46.8	55.2	61.0	
	Positive Image	EU 28	2007-09	48.1	11.9	30.5	39.9	49.4	57.2	62.7
2014-16			37.7	11.2	24.3	29.7	36.7	44.1	52.7	
EU 15		2000-02	47.3	13.7	29.2	36.5	46.1	58.4	66.1	
		2007-09	46.6	11.8	28.9	38.1	47.5	54.7	62.5	
		2014-16	34.1	9.3	22.3	27.3	34.8	40.1	45.7	
EU 13		2007-09	51.3	11.4	34.0	42.5	53.1	59.5	63.1	
		2014-16	45.6	11.0	33.3	36.4	45.0	54.2	60.4	

Notes: Figures are percentages of the population that responded the option represented by the indicator. Support refers to think that the membership of the country to the EU is a good thing; Benefit that the country benefited from belonging to the EU; Trust that the respondent trust in the EU; Positive image that the respondent had this vision of the EU. The number of regions is as follows: 180 for the EU 28; 124 for the EU 15; 56 for the EU 13. The last set of columns refer to the values in the corresponding percentiles.

Table A3.4. Degree of persistence in the indicators in the samples of regions.

	Sample	Coeff (s.e.)	R ²
Membership	EU28 2007-09/2014-16	0.66 (0.055)	0.44
	EU15 2007-09/2014-16	0.71 (0.070)	0.46
	EU13 2007-09/2014-16	0.51 (0.086)	0.39
	EU15 2000-02/2007-09/2014-16	0.70 (0.051)	0.43
Benefit	EU28 2007-09/2014-16	0.57 (0.063)	0.32
	EU15 2007-09/2014-16	0.56 (0.077)	0.30
	EU13 2007-09/2014-16	0.53 (0.062)	0.35
	EU15 2000-02/2007-09/2014-16	0.55 (0.051)	0.32
Trust	EU28 2007-09/2014-16	0.50 (0.062)	0.27
	EU15 2007-09/2014-16	0.40 (0.064)	0.25
	EU13 2007-09/2014-16	0.46 (0.159)	0.13
	EU15 2000-02/2007-09/2014-16	0.46 (0.059)	0.20
Positive Image	EU28 2007-09/2014-16	0.40 (0.064)	0.18
	EU15 2007-09/2014-16	0.24 (0.068)	0.09
	EU13 2007-09/2014-16	0.54 (0.109)	0.31
	EU15 2000-02/2007-09/2014-16	0.41 (0.056)	0.18

Notes: Coeff (s.e.) refers to the estimate of the coefficient and its standard error in a regression between the level of the indicator in each region in a period and in the previous period. Observations used in the estimations are regions of the EU 28 (180), EU 15 (124) and EU 13 (56). The periods used in each case are those indicated in the column labelled as Sample. R² is the coefficient of determination of the corresponding regression.

Annex 4. Description of the variables of the regional context.

Table A4.1. Descriptive of the measures of the regional context.

	SF pc (log)	GDP pc (log)	Tertiary education	Employment Rate	Pop. Dens. (log)	Poverty risk	Social exclusion	EQI	Agricultural employment
Pool									
Mean	3.951	10.026	24.591	64.43	5.086	17.975	26.463	0.187	6.016
Std. Dev.	1.228	0.393	9.242	7.346	1.129	9.210	12.246	0.974	7.263
Obs.	464	460	464	463	450	120	120	148	171
2000-2002									
Mean	3.651	9.969	21.046	63.265	5.233				
Std. Dev.	1.093	0.266	7.746	7.469	1.201				
Obs.	117	110	114	113	100				
2007-2009									
Mean	4.000	10.003	22.852	64.998	5.037	17.227	25.22		
Std. Dev.	1.196	0.449	8.638	7.028	1.099	9.566	12.294		
Obs.	174	175	175	175	175	55	55		
2014-2016									
Mean	4.105	10.085	28.639	64.613	5.05	18.608	27.515	0.187	6.016
Std. Dev.	1.316	0.394	9.272	7.533	1.114	8.922	12.200	0.974	7.263
Obs.	173	175	175	175	175	65	65	148	171

Note: The descriptive statistics for each variable corresponds to the sample of regions used to estimate the coefficients reported in Tables 4.1 to 4.4.

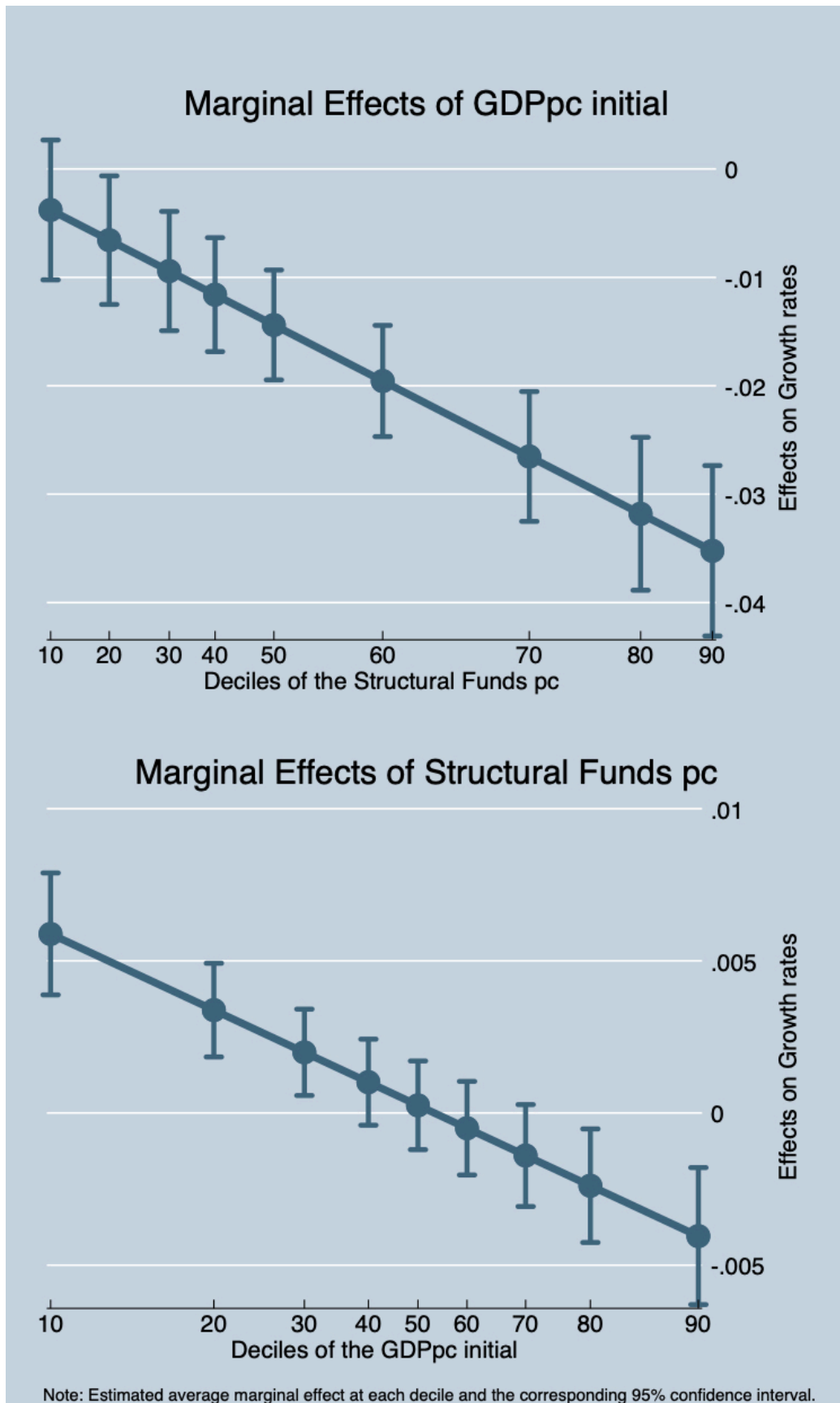
Annex 5. Further results of the growth equation.

Table A5.1. GMM estimates of the growth equation with interactions.

	(i)	(ii)	(iii)	(iv)
GDPpc (t-1)	1.0065*** (0.0059)	1.0533*** (0.0191)	1.0397*** (0.0425)	1.0954*** (0.0290)
SFpc (t-1)	-0.0049* (0.0029)	0.1107*** (0.0396)	0.1667 (0.1351)	0.1922*** (0.0593)
above median SFpc * SFpc (t-1)	0.0093*** (0.0034)			
Primary educ (t-1)	-0.0013 (0.0015)	-0.0018 (0.0016)	-0.0002 (0.0034)	-0.0029* (0.0015)
Tertiary educ (t-1)	0.0008 (0.0015)	0.0016 (0.0014)	-0.0033 (0.0025)	0.0065*** (0.0022)
Employment rate (t-1)	0.0000 (0.0002)	-0.0001 (0.0002)	0.0004** (0.0001)	-0.0000 (0.0003)
Density employment (t-1)	-0.0089 (0.0058)	-0.0057 (0.0066)	-0.0031 (0.0071)	-0.0188 (0.0149)
Density population (t-1)	0.0070 (0.0056)	0.0030 (0.0065)	0.0035 (0.0073)	0.0165 (0.0149)
Country growth	0.9880*** (0.0230)	0.9836*** (0.0220)	1.0037*** (0.0263)	0.9906*** (0.0391)
GDPpc (t-1) * SFpc (t-1)		-0.0111*** (0.0040)	-0.0167 (0.0135)	-0.0195*** (0.0061)
above median SFpc	-0.0369*** (0.0132)			
Observations	1,795	1,926	983	812
A-B AR(1) test	-4.26***	-4.45***	-2.51**	-4.39***
A-B AR(2) test	1.74*	1.64	1.31	1.16
Hansen test	52.56	34.98	43.20	31.64
Number of instruments	77	63	63	59
Average Marginal Effects				
SF pc	Below median	-0.0049 (0.0029)		
	Above median	0.0044*** (0.0017)		
GDPpc (t-1)		1.0101*** (0.0056)	0.9882*** (0.0083)	1.001*** (0.0052)
SFpc		-0.0006 (0.0013)	-0.0036 (0.0043)	0.0012 (0.0019)

Notes: System-GMM estimates, collapsing the set of instruments. GDPpc denotes GDP per capita, SFpc the amount of Structural Fund expenditures per capita in the region and year, and above/below median is a dummy variable that identify regions in which SFpc are above/below the median amount of SFpc. Control variables as described in the text. A-B AR(1/2) refers to the Arellano-Bond autocorrelation tests. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Figure A5.1. Marginal effects at different initial GDPpc and SFpc at the deciles of the distributions.



Note: Computed from specification without regional controls (Column iv in Table 5.1).